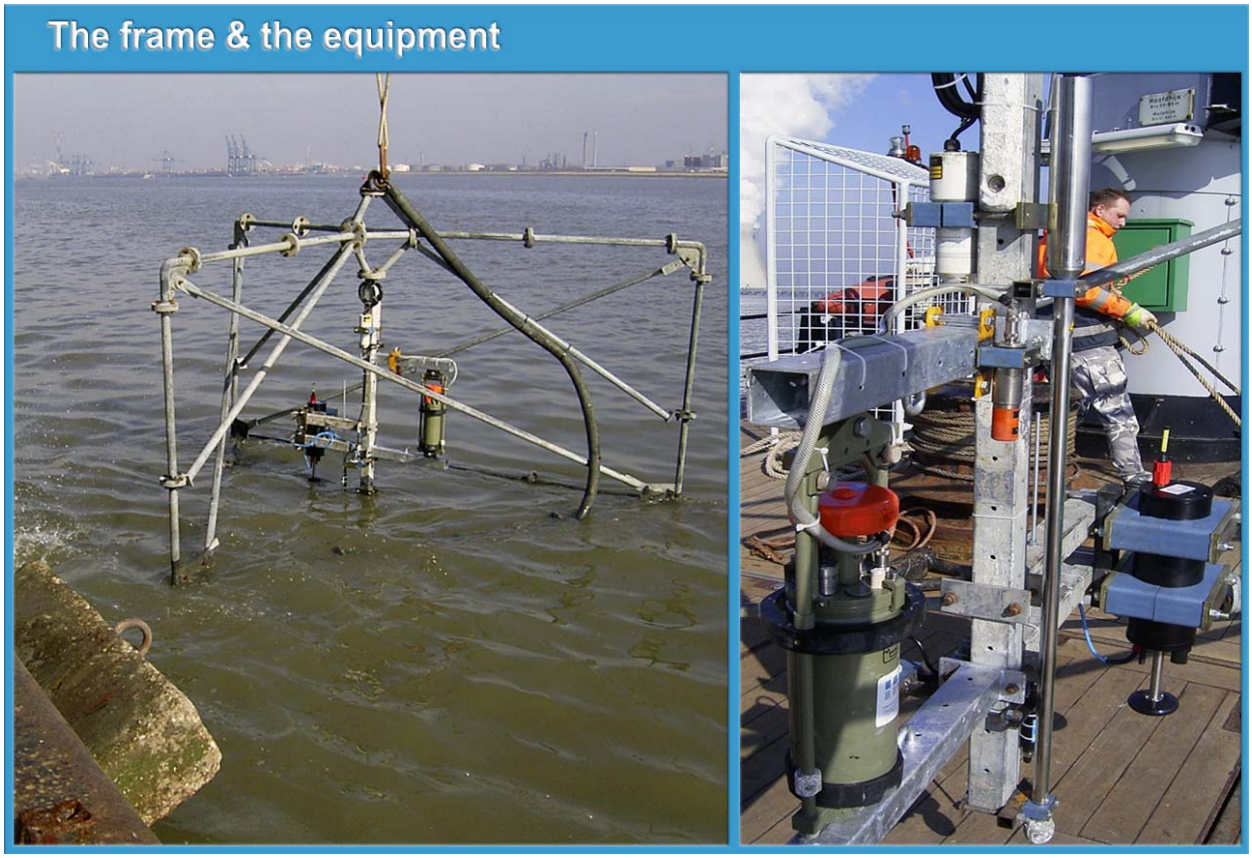
VLAAMSE OVERHEID

DEPARTEMENT MOBILITEIT EN OPENBARE WERKEN
WATERBOUWKUNDIG LABORATORIUM

Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing

Bestek 16EB/05/04



Deelrapport 2.8 : Zout – en slibverdeling Deurganckdok & frame metingen 12/02/2007 – 18/04/2007

Report 2.8: Salt – Silt distribution & frame measurements Deurganckdok 12/02/2007 – 18/04/2007

6 July 2007
I/RA/11283/06.123/MSA

i.s.m. &

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Document Control Sheet

Document Identification

Title:	Report 2.8 : Salt-Silt distribution & frame measurements Deurganckdok (2/2007 - 4/2007)
Project:	Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing
Client	Waterbouwkundig Laboratorium
File reference	I/RA/11283/06.123/MSA
File Name	K:\PROJECTS\11\11283 - Opvolging aanslibbing dgd\10-Rap\DGD1\RA06123_Salt_Silt_winter07\Ra06123_Salt_Silt_winter07_2.0.doc

Revisions

Version	Date	Author	Description
2.0	06/07/2007	BOB/MBO	Final report
1.0	20/06/2007	YDK/SRI/BOB	Concept

Distribution list

Name	# ex.	Company/authorities	Position in reference to the project
Joris Vanlede	7	Waterbouwkundig Laboratorium	client
Frederik Roose	3	Afdeling Maritieme Toegang	client

Approval

Version	Date	Author	Project manager	Commissioner
2.0	06/07/2007	BOB/MBO	MSA	MSA
1.0	20/06/2007	YDK/SRI/BOB	MSA	MSA

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1. INTRODUCTION

1.1. The assignment

This report is part of the set of reports describing the results of the long-term measurements conducted in Deurganckdok aiming at the monitoring and analysis of silt accretion. This measurement campaign is an extension of the study "Extension of the study about density currents in the Beneden Zeeschelde" as part of the Long Term Vision for the Scheldt estuary. It is complementary to the study 'Field measurements high-concentration benthic suspensions (HCBS 2)'.

The terms of reference for this study were prepared by the 'Departement Mobiliteit en Openbare Werken van de Vlaamse Overheid, Afdeling Waterbouwkundig Laboratorium' (16EB/05/04). The study was awarded to International Marine and Dredging Consultants NV in association with WL|Delft Hydraulics and Gems International on 10/01/2006.

Waterbouwkundig Laboratorium– Cel Hydrometrie Schelde provided data on discharge, tide, salinity and turbidity along the river Scheldt and provided survey vessels for the long term and through tide measurements. Afdeling Maritieme Toegang provided maintenance dredging data. Agentschap voor Maritieme Dienstverlening en Kust – Afdeling Kust and Port of Antwerp provided depth sounding measurements.

The execution of the study involves a twofold assignment:

- Part 1: Setting up a sediment balance of Deurganckdok covering a period of one year
- Part 2: An analysis of the parameters contributing to siltation in Deurganckdok

1.2. Purpose of the study

The Lower Sea Scheldt (Beneden Zeeschelde) is the stretch of the Scheldt estuary between the Belgium-Dutch border and Rupelmonde, where the entrance channels to the Antwerp sea locks are located. The navigation channel has a sandy bed, whereas the shallower areas (intertidal areas, mud flats, salt marshes) consist of sandy clay or even pure mud sometimes. This part of the Scheldt is characterized by large horizontal salinity gradients and the presence of a turbidity maximum with depth-averaged concentrations ranging from 50 to 500 mg/l at grain sizes of 60 - 100 μm. The salinity gradients generate significant density currents between the river and the entrance channels to the locks, causing large siltation rates. It is to be expected that in the near future also the Deurganckdok will suffer from such large siltation rates, which may double the amount of dredging material to be dumped in the Lower Sea Scheldt.

Results from the study may be interpreted by comparison with results from the HCBS and HCBS2 studies covering the whole Lower Sea Scheldt. These studies included through-tide measurement campaigns in the vicinity of Deurganckdok and long term measurements of turbidity and salinity in and near Deurganckdok.

The first part of the study focuses on obtaining a sediment balance of Deurganckdok. Aside from natural sedimentation, the sediment balance is influenced by the maintenance and capital dredging works. This involves sediment influx from capital dredging works in the Deurganckdok, and internal relocation and removal of sediment by maintenance dredging works. To compute a sediment balance an inventory of bathymetric data (depth soundings), density measurements of the deposited material and detailed information of capital and maintenance dredging works will be made up.

The second part of the study is to gain insight in the mechanisms causing siltation in Deurganckdok, it is important to follow the evolution of the parameters involved, and this on a long

and short term basis (long term & through-tide measurements). Previous research has shown the importance of water exchange at the entrance of Deurganckdok as essential for understanding sediment transport between the dock and the Scheldt river.

1.3. Overview of the Reports

Reports of the project 'Opvolging aanslibbing Deurganckdok' are summarized in Table 1-1.

Reports of the measurement campaign HCBS2 for which the winter and summer campaign has been carried out simultaneously with measurements in this report are listed in APPENDIX F.

Table 1-1: Overview of Deurganckdok Reports

Report	Description
Sediment Balance: Bathymetry surveys, Density measurements, Maintenance and construction dredging activities	
1.1	Sediment Balance: Three monthly report 1/4/2006 – 30/06/2006 (I/RA/11283/06.113/MSA)
1.2	Sediment Balance: Three monthly report 1/7/2006 – 30/09/2006 (I/RA/11283/06.114/MSA)
1.3	Sediment Balance: Three monthly report 1/10/2006 – 31/12/2006 (I/RA/11283/06.115/MSA)
1.4	Sediment Balance: Three monthly report 1/1/2007 – 31/03/2007 (I/RA/11283/06.116/MSA)
1.5	Annual Sediment Balance (I/RA/11283/06.117/MSA)
1.6	Sediment balance Bathymetry: 2005 – 3/2006 (I/RA/11283/06.118/MSA)
Factors contributing to salt and sediment distribution in Deurganckdok: Salt-Silt (OBS3A) & Frame measurements, Through tide measurements (SiltProfiling & ADCP)	
2.1	Through tide measurement Siltprofiler 21/03/2006 Laure Marie (I/RA/11283/06.087/WGO)
2.2	Through tide measurement Siltprofiler 26/09/2006 Stream (I/RA/11283/06.068/MSA)
2.3	Through tide measurement Sediview spring tide 22/03/2006 Veremans (I/RA/11283/06.110/BDC)
2.4	Through tide measurement Sediview spring tide 27/09/2006 Parel 2 (I/RA/11283/06.119/MSA)
~~2.5~~	~~Through tide measurement Sediview neap tide (to be scheduled) (I/RA/11283/06.120/MSA)~~[1]
2.6	Salt-Silt distribution & Frame Measurements Deurganckdok 13/3/2006 – 31/05/2006 (I/RA/11283/06.121/MSA)
2.7	Salt-Silt distribution & Frame Measurements Deurganckdok 15/07/2006 – 31/10/2006 (I/RA/11283/06.122/MSA)
2.8	Salt-Silt distribution & Frame Measurements Deurganckdok 12/02/2007 – 18/04/2007 (I/RA/11283/06.123/MSA)

[1] cancelled report

Report	Description
Boundary Conditions: Upriver Discharge, Salt concentration Scheldt, Bathymetric evolution in access channels, dredging activities in Lower Sea Scheldt and access channels	
3.1	Boundary conditions: Three monthly report 1/1/2007 – 31/03/2007 (I/RA/11283/06.127/MSA)
~~3.2~~	~~Boundary condtions: Annual report (I/RA/11283/06.128/MSA)~~[2]
Analysis	
4	Analysis of Siltation Processes and Factors (I/RA/11283/06.129/MSA)

1.3.1. Measurement actions

Following measurements have been carried out during the course of this project:

1. Monitoring upstream discharge in the Scheldt river
2. Monitoring Salt and sediment concentration in the Lower Sea Scheldt taken from on permanent data acquisition sites at Lillo, Oosterweel and up- and downstream of the Deurganckdok.
3. Long term measurement of salt distribution in Deurganckdok.
4. Long term measurement of sediment concentration in Deurganckdok
5. Monitoring near-bed processes in the central trench in the dock, near the entrance as well as near the landward end: near-bed turbidity, near-bed current velocity and bed elevation variations are measured from a fixed frame placed on the dock's bed.
6. Measurement of current, salt and sediment transport at the entrance of Deurganckdok for which ADCP backscatter intensity over a full cross section are calibrated with the Sediview procedure and vertical sediment and salt profiles are recorded with the SiltProfiler equipment
7. Through tide measurements of vertical sediment concentration profiles -including near bed highly concentrated suspensions- with the SiltProfiler equipment. Executed over a grid of points near the entrance of Deurganckdok.
8. Monitoring dredging activities at entrance channels towards the Kallo, Zandvliet and Berendrecht locks
9. Monitoring dredging and dumping activities in the Lower Sea Scheldt

In situ calibrations were conducted on several dates to calibrate all turbidity and conductivity sensors (IMDC, 2006a & IMDC, 2007a).

1.4. Structure of this report

This report is the factual data report for two measurement campaigns:

- Long term salt/silt measurements in the Deurganckdok

[2] considered in report 5.6 'Analysis of ambient conditions during 2006' (I/RA/11291/06.091/MSA) in the framework of the study 'Extension of the study about density currents in the Beneden Zeeschelde'

- Near bed frame measurements in the vicinity of Deurganckdok from the 9th of February until the 18th of April 2007.

The first chapter comprises an introduction. The second chapter describes the project. Chapter 3 describes the measurement campaign, equipment and the course of the actual measurements. The measurement results and processed data are presented in Chapter 4, whereas chapter 5 gives a preliminary analysis of the data.

2. SEDIMENTATION IN DEURGANCKDOK

2.1. Project Area: Deurganckdok

Deurganckdok is a tidal dock situated at the left bank in the Lower Sea Scheldt, between Liefkenshoek and Doel. Deurganckdok has the following characteristics:

1. the dock has a total length of 2750 m and is 450 m wide at the Scheldt end and 400 m wide at the inward end of the dock
2. The bottom of Deurganckdok is provided at a depth of –17m TAW in the transition zones between the quay walls and the central trench and of –19m TAW in the central trench.
3. the quay walls reach up to +9m TAW

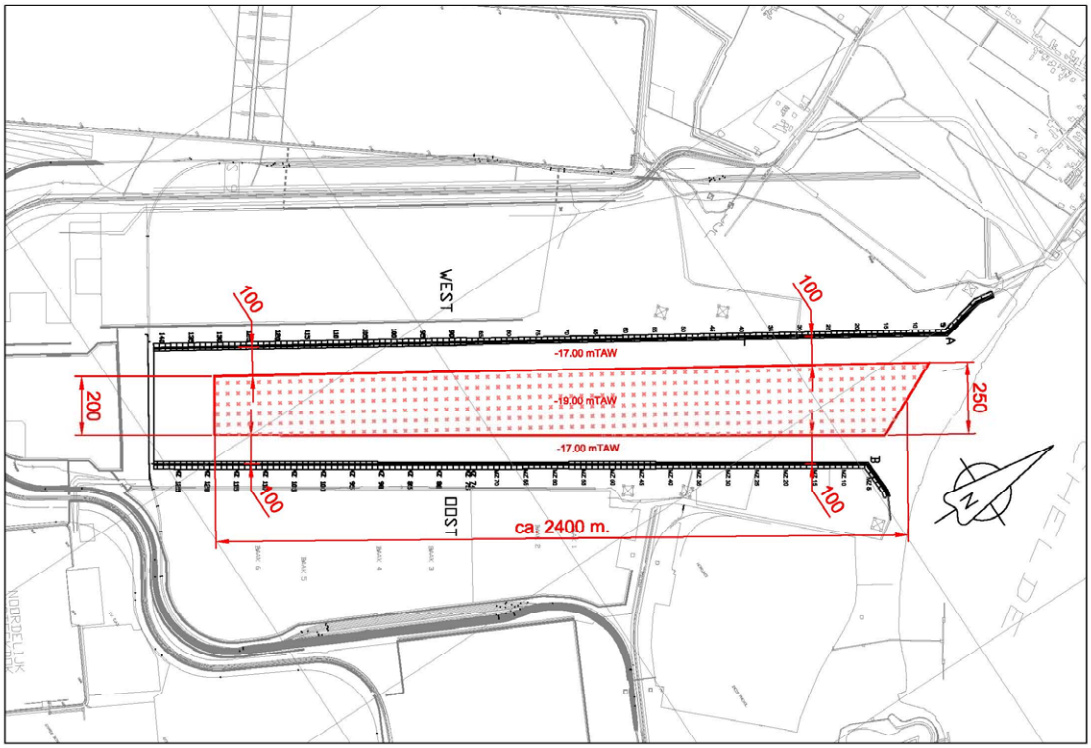

Figure 2-1: Overview of Deurganckdok

The dredging of the dock is performed in 3 phases. On 18 February 2005 the dike between the Scheldt and the Deurganckdok was breached. On 6 July 2005 Deurganckdok was officially opened. The second dredging phase was finalized a few weeks later. The first terminal operations have started since.

2.2. Overview of the studied parameters

The first part of the study aims at determining a sediment balance of Deurganckdok and the net influx of sediment. The sediment balance comprises a number of sediment transport modes: deposition, influx from capital dredging works, internal replacement and removal of sediments due to maintenance dredging (Figure 2-2).

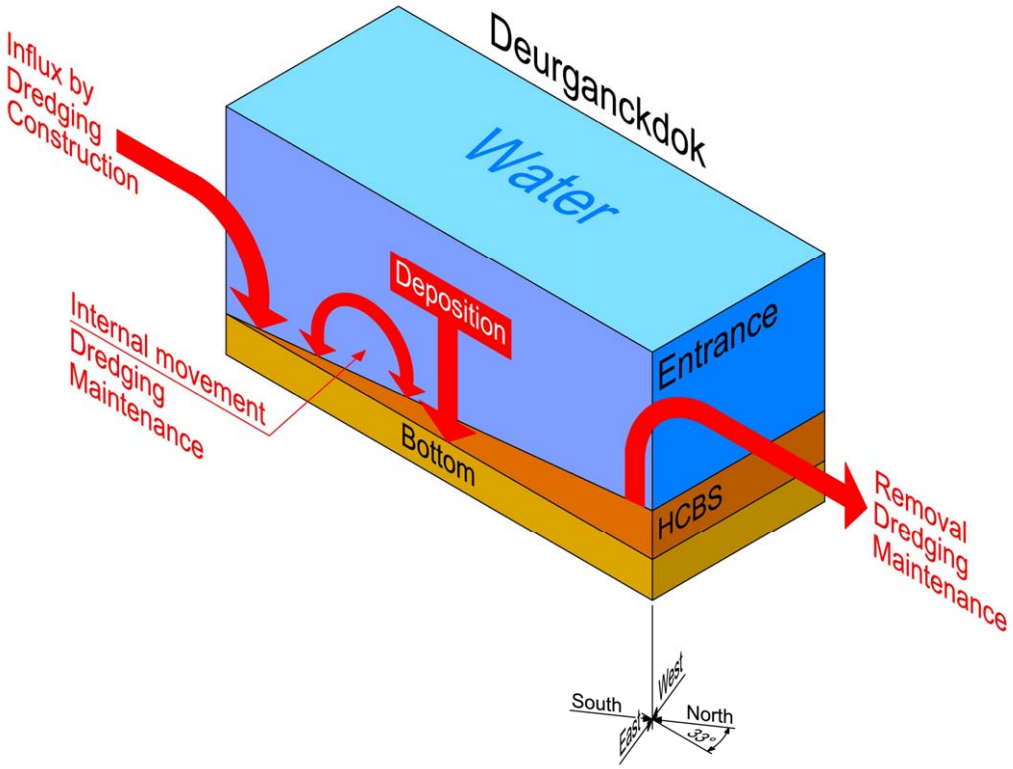

Figure 2-2: Elements of the sediment balance

A net deposition can be calculated from a comparison with a chosen initial condition t_0 (Figure 2-3). The mass of deposited sediment is determined from the integration of bed density profiles recorded at grid points covering the dock. Subtracting bed sediment mass at t_0 leads to the change in mass of sediments present in the dock (mass growth). Adding cumulated dry matter mass of dredged material removed since t_0 and subtracting any sediment influx due to capital dredging works leads to the total cumulated mass entered from the Scheldt river since t_0.

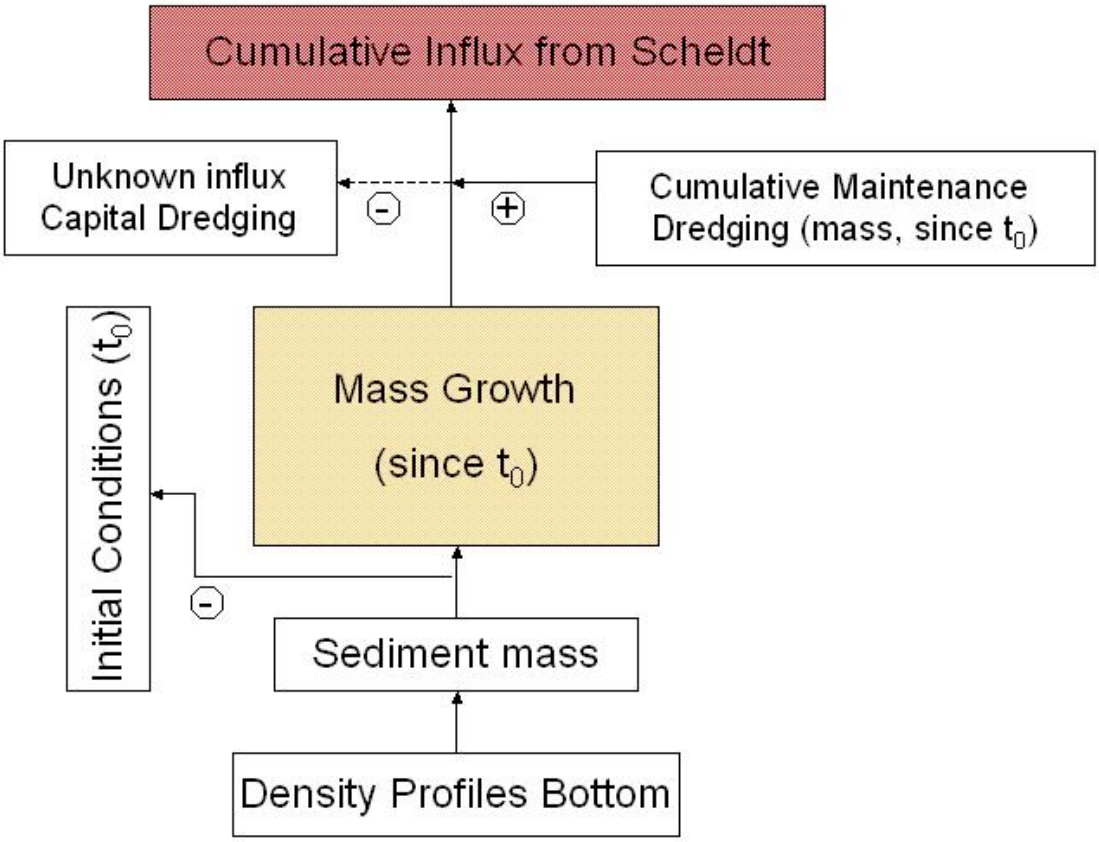

Figure 2-3: Determining a sediment balance

The main purpose of the second part of the study is to gain insight in the mechanisms causing siltation in Deurganckdok. The following mechanisms will be aimed at in this part of the study:

- Tidal prism, i.e. the extra volume in a water body due to high tide
- Vortex patterns due to passing tidal current
- Density currents due to salt gradient between the Scheldt river and the dock
- Density currents due to highly concentrated benthic suspensions

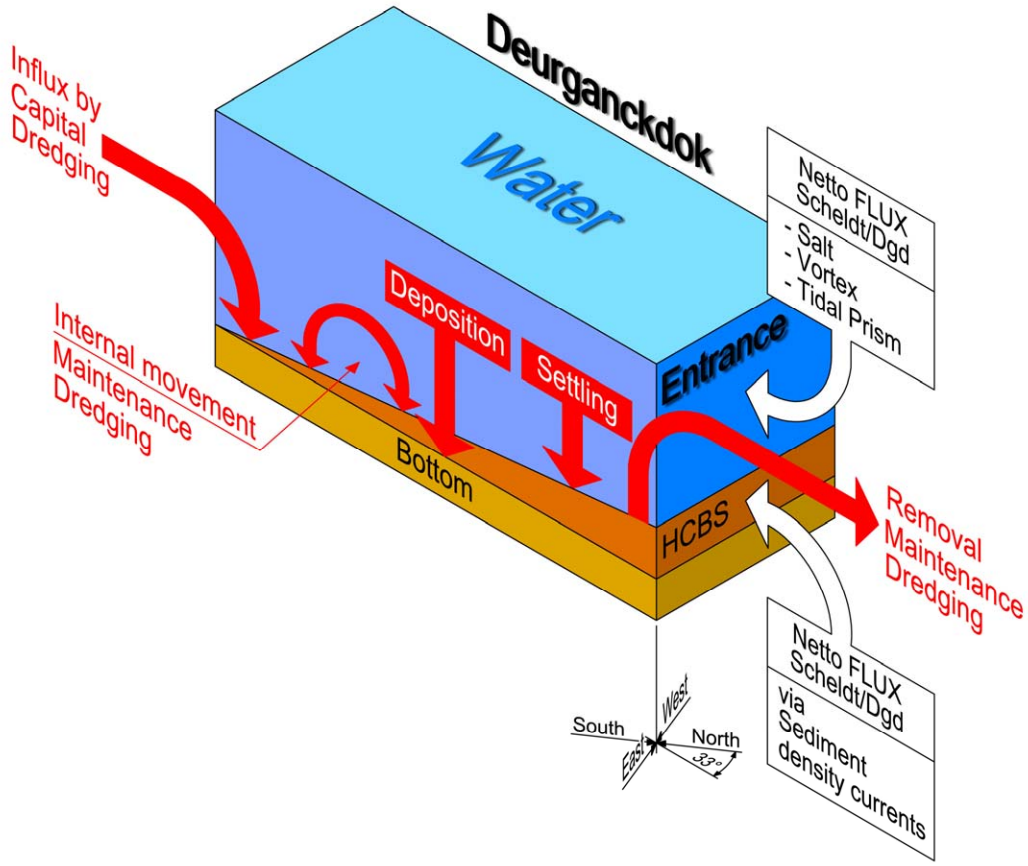

Figure 2-4: Transport mechanisms

These aspects of hydrodynamics and sediment transport have been landmark in determining the parameters to be measured during the project. Measurements will be focused on three types of timescales: one tidal cycle, one neap-spring cycle and seasonal variation within one year.

Following data are being collected to understand these mechanisms:

- Monitoring upstream discharge in the Scheldt river.
- Monitoring Salt and sediment concentration in the Lower Sea Scheldt at permanent measurement locations at Oosterweel, up- and downstream of the Deurganckdok.
- Long term measurement of salt and suspended sediment distribution in Deurganckdok.
- Monitoring near-bed processes (current velocity, turbidity, and bed elevation variations) in the central trench in the dock, near the entrance as well as near the current deflecting wall location.
- Dynamic measurements of current, salt and sediment transport at the entrance of Deurganckdok.
- Through tide measurements of vertical sediment concentration profiles -including near bed high concentrated benthic suspensions.
- Monitoring dredging activities at entrance channels towards the Kallo, Zandvliet and Berendrecht locks as well as dredging and dumping activities in the Lower Sea Scheldt.
- In situ calibrations were conducted on several dates to calibrate all turbidity and conductivity sensors.

2.3. Measurement objectives

2.3.1. Objective of the near bed continuous monitoring

The purpose of the deployment of the anchored measuring frame/rig is to monitor the detailed vertical structure of flow and suspended sediment concentration within a few decimeters from the bed. This frame measures at one location only, by definition, and is difficult to reposition. Therefore, it should be positioned at a location where near-bed HCBS are most likely, and with a vertical resolution of the instruments that matches the concentration gradients in suspension. The vertical flow and sediment structure assessed with the preliminary 3D mud transport model allows for an optimization of the layout of the anchored measuring frame with respect to the instrumentation.

2.3.2. Objective of the long term measurements near the quay walls

The goal of the survey is to monitor the spatial distribution of salt and silt in the Deurganckdok. Longitudinal, vertical and horizontal (from north to south quay) distribution is surveyed in this set up. The entrance of the dock is a favoured location because of the dynamics caused by the river-dock interaction. One deeper location in the dock is necessary to sample the longitudinal distribution of salt and silt along the dock.

3. THE MEASUREMENT CAMPAIGNS

3.1. Description of the long term suspended sediment-salinity measurements 12/02/2007 – 27/03/2007

3.1.1. Measurement location

During the period from 12/02/2007 till 27/03/2007, 6 multi parameter probes were placed on 3 fixed locations hanging from the quay wall in Deurganckdok at fixed depths.

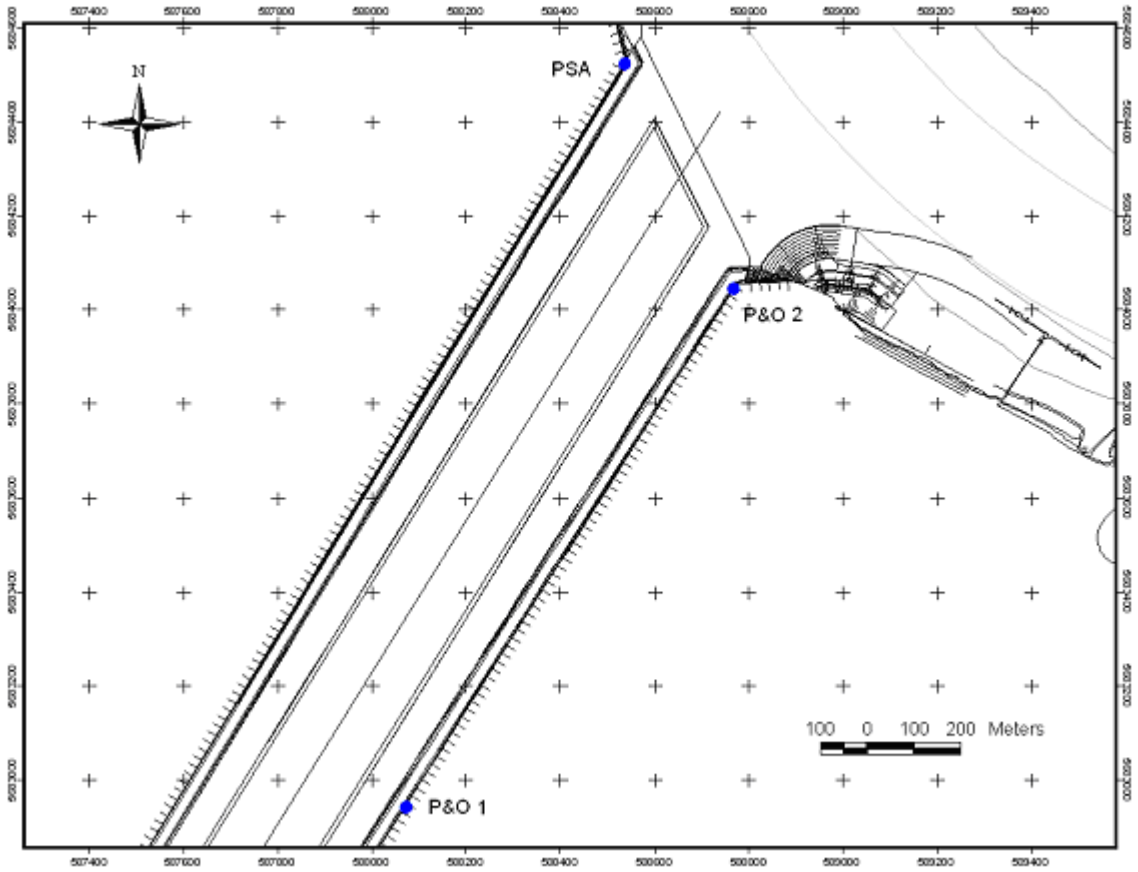

Figure 3-1: Map of the measurement locations for long term salt-silt measurements in Deurganckdok

Table 3-1: Measurement locations in UTM ED50

Location	***EASTING***	***NORTHING***	***Boulder***	***Operator***
P&O 1 (S-back)	588074	5682942	Moot 72	P&O Ports
P&O 2 (S-entrance)	588767	5684045	Moot 7	P&O Ports
PSA (N-entrance)	588536	5684523	Moot 5 (boulder 286)	PSA HNN

Table 3-2: Deployment depths of all instruments for the measurement period

Salt Silt Measurements Deurganckdok				
Location	*Easting (UTM ED 50)*	*Northing (UTM ED 50)*	*Depth of instrument [m TAW]*	*Period*
P&O 1 top	588074	5682942	-2.6	12/02/2007 – 27/03/2007
P&O 1 bottom	588074	5682942	-12.1	12/02/2007 – 27/03/2007
P&O 2 top	588767	5684045	-2.2	12/02/2007 – 27/03/2007
P&O 2 bottom	588767	5684045	-13.0	13/02/2007 – 27/03/2007
PSA top	588536	5684523	-2.3	12/02/2007 – 27/03/2007
PSA bottom	588536	5684523	-12.0	12/02/2007 – 27/03/2007

3.1.2. The equipment

3.1.2.1. Quay Frame set up

A simple rectangular measurement frame was conceived for suspending the instruments from the quay wall down into the Deurganckdok. Two frames rest against the dock wall and are suspended by stainless steel cables hanging from a rawlplug, secured on top of the quay wall.

Using a guiding system and a winch, it was possible to recover these instruments without the help of a survey vessel.

Figure 3-2: Guiding system and chain suspended from the rawlplug (left), frame with RCM-9 and steel cables (right)

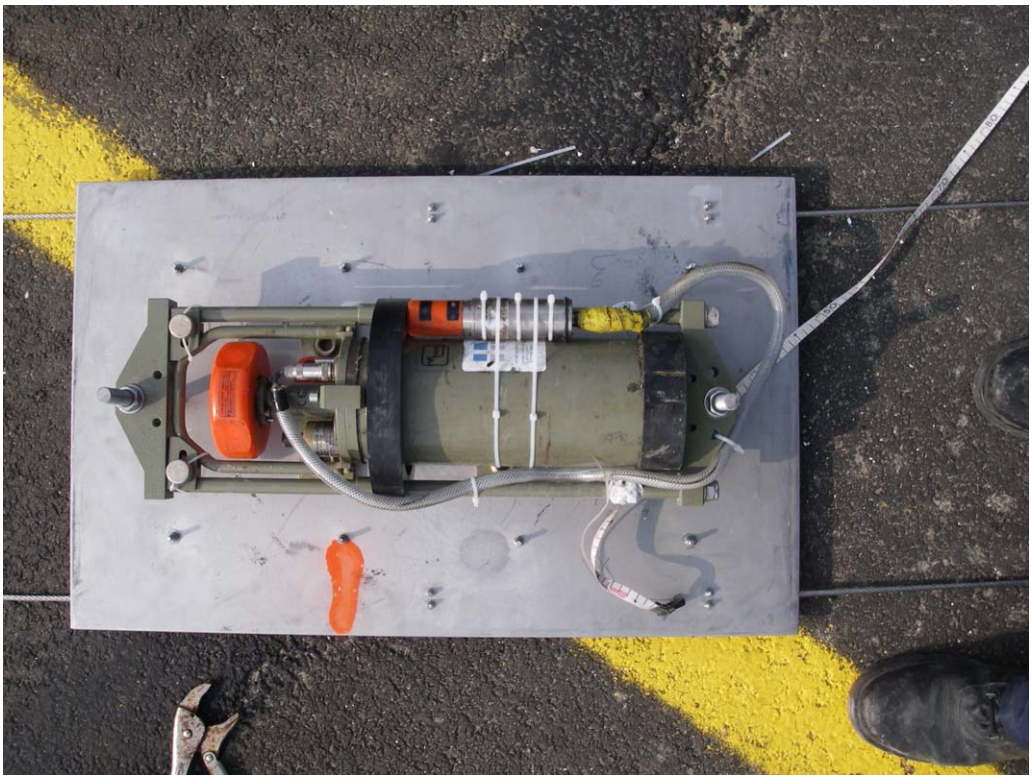

Figure 3-3: frame design

3.1.2.2. Aanderaa RCM-9

The Aanderaa Recording Current Meter RCM-9 MkII is a multi-parameter instrument that consists of a CTD probe, Doppler Current Sensors and a Turbidity Sensor. It was set up to measure an average of a number of pings spread over an interval of 10 minutes for conductivity, depth, temperature and turbidity.

IMDC (2006a) gives more technical details on the RCM-9.

3.1.2.3. D& A Instruments OBS 3A

The D & A Instruments OBS 3A is a multiparameter instruments that consists of a CTD probe and a turbidity sensor. The instrument was set up to measure every ten minutes for a minute at a frequency of 1 Hz and output the average.

IMDC (2006a) gives more technical details on the OBS 3A.

3.1.3. Course of the measurements

After deployment on 20/07/2006, the instruments were recovered, cleaned and read out every two weeks. Table 3-3 lists the measurement periods and possible issues. Only OBS 3A instruments were deployed during this measurement period

Table 3-3: Overview of measurement periods and data gaps

P&O1 (S-BACK): -12.1 m TAW			
Period	*No data*	*Faulty data*	*Comments*
12/02/2007			Start measurement period
16-18/03/2007	X		Gaps in data
27/03/2007			End measurement period
P&O1 (S-BACK): -2.6 m TAW			
Period	*No data*	*Faulty data*	*Comments*
12/02/2007			Start measurement period
27/03/2007			End measurement period
P&O 2 (S-ENTRANCE): -13.0 m TAW			
Period	*No data*	*Faulty data*	*Comments*
13/02/2007			Start measurement period
27/03/2007			End measurement period
P&O 2 (S-ENTRANCE): -2.2 m TAW			
Period	*No data*	*Faulty data*	*Comments*
12/02/2007			Start measurement period
27/03/2007			End measurement period
PSA (N-ENTRANCE): -12.0 m TAW			
Period	*No data*	*Faulty data*	*Comments*
12/02/2007			Start measurement period
27/03/2007			End measurement period
PSA (N-ENTRANCE): -2.3 m TAW			
Period	*No data*	*Faulty data*	*Comments*
12/02/2007	X		Start measurement period
27/03/2007			End measurement period

3.2. Description of the near bed continuous monitoring 9/2/2007 – 18/4/2007

3.2.1. Measurement location

During the period 09/02/2007 till 18/04/2007, two frames were placed in the vicinity of the entrance of Deurganckdok. The first one was placed at the upstream edge of the Deurganckdock, on the sill. The depth at the location of the frame is –11m TAW roughly. Placement of the frame occurred at 14h10 (9th of February), removal of the frame at 10h00 (18th of April). The second frame was placed at the downstream edge of the dock. This location is situated nearby the future CDW location (Current Deflecting Wall), near the left bank of the Scheldt. The frame was placed at a depth of –14m TAW roughly. The placement of this frame occurred at 12h30 (15th of March), removal of the frame at 11h20 (12th of April). To signal the presence of the frames buoys were place near the frames.

Spring tides occurred around 19th of February 2007, the 20th of March 2007 and 17th of April 2007. Time is always given in MET.

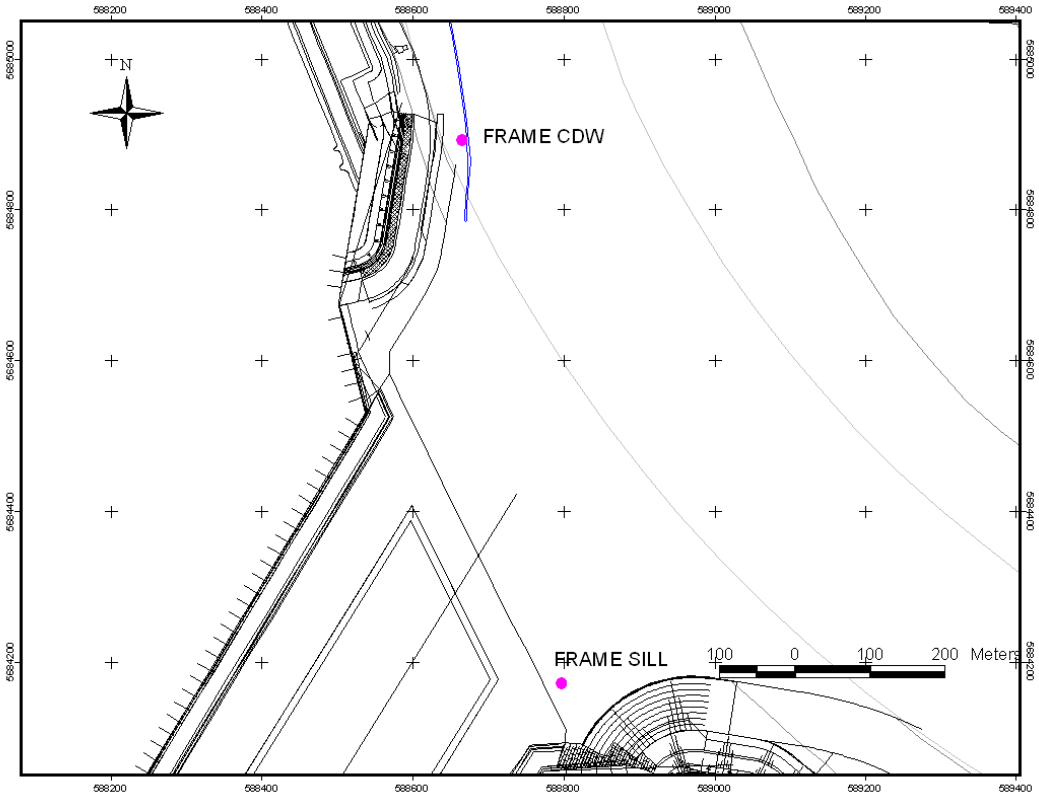

Figure 3-4: Map of the measurement location

3.2.2. The equipment

3.2.2.1. The frames

Two new frames were developed for autonomous measurement of sediment transport phenomena. The frames are equipped with an ARGUS ASM-IV high-resolution turbidity array, an ALTUS precision echosounder and furthermore two multiprobes: an Aanderaa RCM-9 and a

Valeport MIDAS. This way proper instrumentation in the near bed zone was ensured. Data about the orientation, pitch and roll of the frames is obtained from a magnetic compass (orientation, Valeport MIDAS) and a tilt sensor (pitch and roll, ARGUS ASM-IV / Aanderaa RCM-9).

Set up of the CDW frame is as follows:

- The RCM 9 was installed at 1m above the bottom, with the following sensors: a CTD probe, Doppler Current Sensors and a Turbidity Sensor
- The Valeport Midas was installed at 0.1m above the bottom, with the following sensors: a CTD-probe, an electromagnetic Current Meter (ECM) and an OBS3+ turbidity sensor
- The ALTUS was installed at 0.45m above the bottom
- The ARGUS ASM-IV was installed in such a way that the lowest turbidity sensor was placed at 0.29m above the bottom

Since the Sill frame penetrated considerably during previous measurements, the supporting surface was enlarged. Further set up of the Sill frame is as follows:

- The RCM 9 was installed at 1m above the bottom, with the following sensors: a CTD probe, Doppler Current Sensors and a Turbidity Sensor
- The Valeport Midas was installed at 0.1m above the bottom, with the following sensors: a CTD-probe, an electromagnetic Current Meter (ECM) and an OBS3+ turbidity sensor
- The ALTUS was installed at 0.45m above the bottom
- The ARGUS ASM-IV was installed in such a way that the lowest turbidity sensor was placed at 0.20m above the bottom

This is anticipated to allow a proper measurement of the lower current profile and give additional information on the suspended sediment concentration structure. Figure 3-5 shows the CDW frame with all the sensors. The Sill frame is built up identically.

Each sensor had its own data logger and power supply from internal batteries.

The frames were designed for easy transport and installation. The sensor positions, in particular sensor height above the bed, can be adjusted to specific requirements over a wide range. The structure of the frames consists of a tripod with a separation of about 4 metres between the legs. The height is about 2.3 m. Several girders give the frames the required sturdiness. The sensors can be clamped to adjustable supports. Hoisting support facilities are attached to the top of the frames.

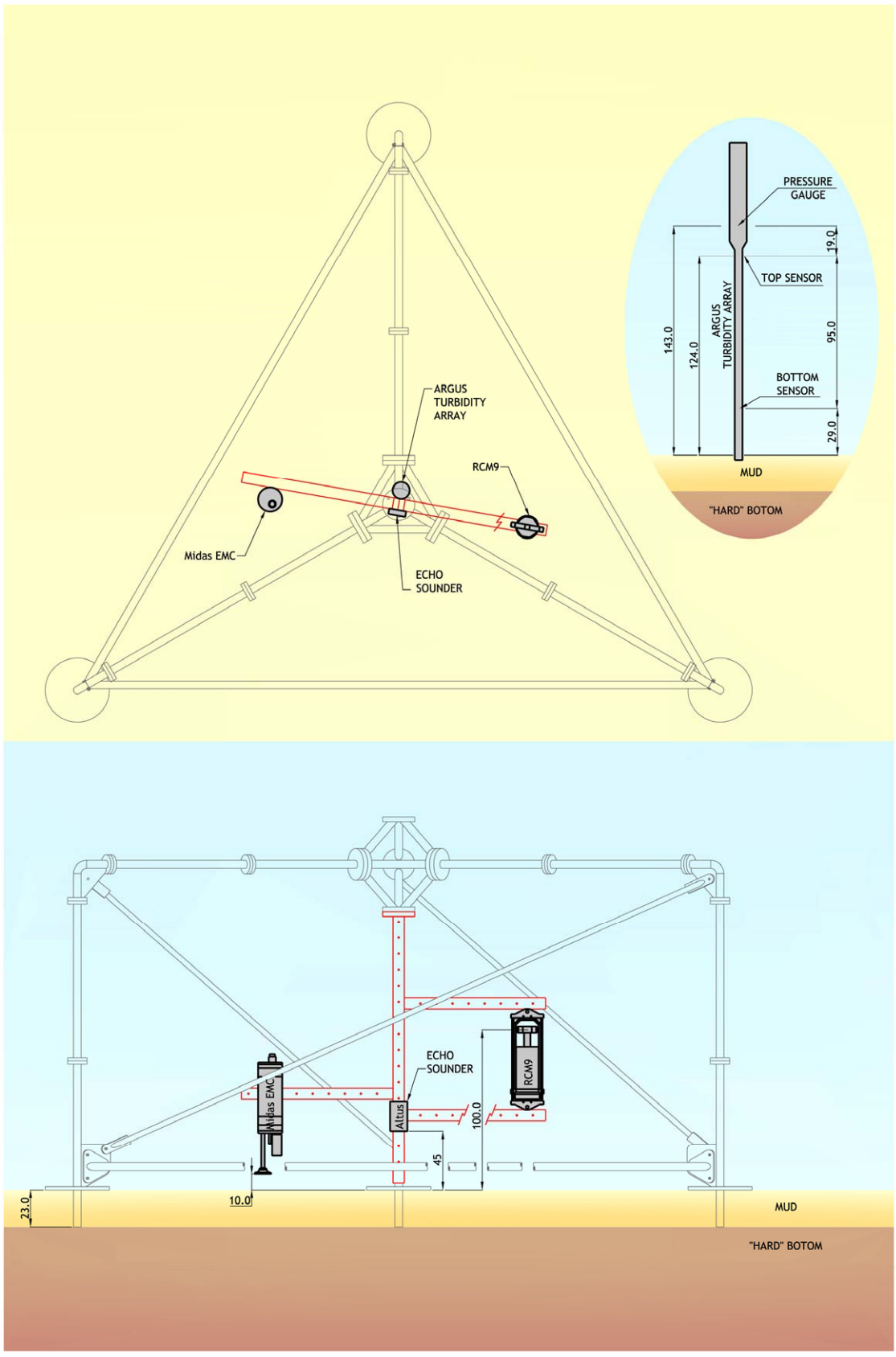

Figure 3-5: Sketch of the CDW frame with all the sensors (dimensions in [cm])

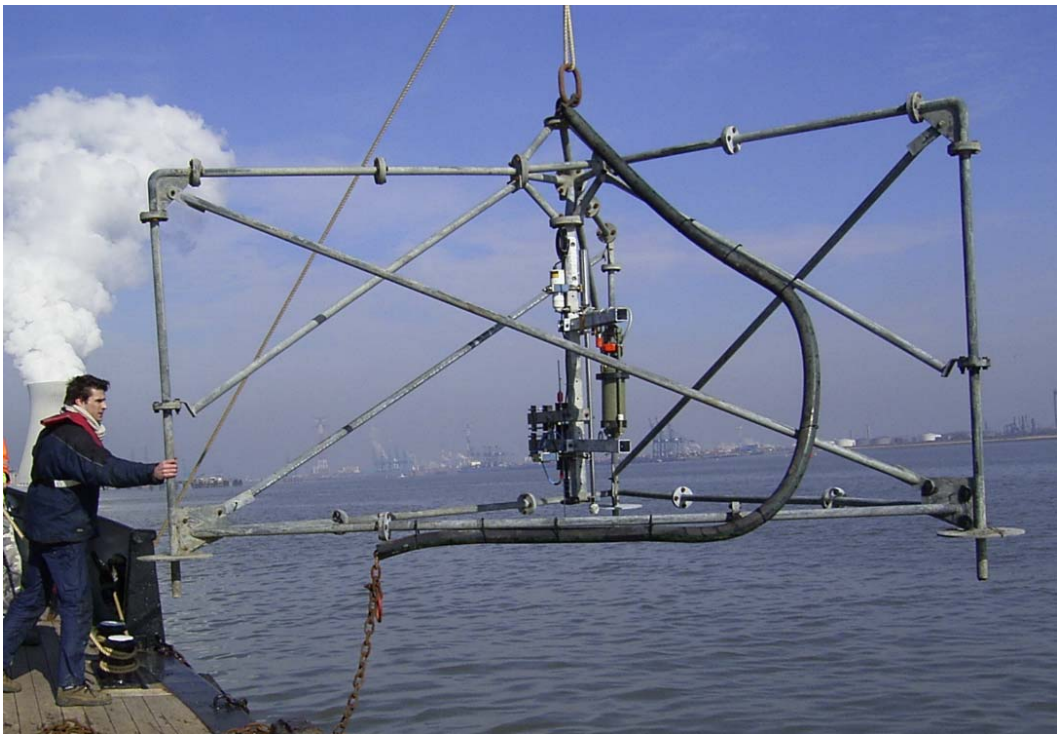

Figure 3-6: Installation of the CDW frame

3.2.2.2. ARGUS ASM-IV

The ARGUS ASM-IV was used to detect the vertical structure of the suspended sediment concentration in the zone of 1 meter above the bed.

The ARGUS ASM-IV was developed for high resolution measuring of accretion and erosion of the riverbed. (ARGUS UMWELT-MEATECHNIK, 2005). The instrument operates with backscatter infrared laser sensors embedded in a stainless steel rod. The 96 sensors are placed on an active board at a distance of 0.01m of each other. There are three additional sensors: an inclinometer, a pressure gauge and a on board temperature sensor.

A battery powered central unit in the head of the instrument controls activation and power supply of the sensors as well as the transmission of the signals. The sealed in unit consists of a microprocessor, a data memory, the additional sensors and the energy supply.

The ARGUS ASM-IV has a sampling interval of 5 seconds and every cycle there are 20 samples taken. The break range between each burst (i.e. pause) is set at 500 seconds. This means that the total cycle time is 600 seconds.

The measurement range of the ARGUS ASM-IV is from 0 to 5000mg/l.

More details on the ARGUS ASM-IV can be found in the February Survey Reports of the HCBS 1 measurement campaign (IMDC, 2005h)

Figure 3-7: ARGUS ASM-IV

3.2.2.3. ALTUS

The ALTUS is specially designed for mainly muddy environments to precisely quantify changes of bottom elevation. It is a high frequency acoustic submersible recording altimeter and is based on a 2 MHz echo sounder which transducer is located at a given distance from the bed. The echosounder was attached to the frame such that (looking downward) it can measure bottom variations with an accuracy of about 2mm. A separate container includes altimeter electronics, data logger, pressure sensor and energy.

The logging cadence was 600 seconds.

The technical details on the Altus are described in the February Survey Reports of the HCBS 1 measurement campaign (IMDC, 2005h).

3.2.2.4. Valeport MIDAS OBS3+

The Valeport MIDAS is a multiparameter instrument that has a CTD- probe, an electromagnetic Current Meter (EMC) and an OBS3+ turbidity sensor with a range of 0-1500 FTU. The instrument was set to measure in cycles of 10 minutes, divided into 100 samples at a rate of 1Hz and a pause of 500 seconds.

The principle of the electromagnetic current meter enables velocity measurements at very large suspended sediment concentrations (in comparison to measurement techniques based on the Doppler principle). Further technical details on the Valeport MIDAS OBS3+ are described in the Report 6.1 Winter calibration (IMDC, 2006a) of the HCBS2 Measurement campaign.

Figure 3-8: Valeport MIDAS EMC and OBS3+

3.2.2.5. Aanderaa RCM-9

The Aanderaa Recording Current Meter RCM-9 MkII is a multi-parameter instrument that consists of a CTD probe, Doppler Current Sensors and a Turbidity Sensor. The instrument was set up to measure every 10 minutes. All sensors (temperature, pressure, conductivity, turbidity, tilting) except the Doppler Current Sensor were set to record once every 10 minutes. The Doppler Current Sensor sent 600 pings during every 10 minute-interval and calculated the average value for current speed and direction over this interval. Data storage units in the instruments logged all the measured values..

IMDC (2006a) gives more technical details on the RCM-9.

Figure 3-9: Aanderaa RCM-9

3.2.3. Course of the measurements

At the entrance of Deurganckdok the two frames were set to measure, the Sill frame from the 9th of February until the 18th of April 2007 and the CDW frame from the 15th of March till the 12th of April 2007. Every week one of the two frames was recovered, the data of all equipment was downloaded and batteries were replaced, whereupon the frame was deployed again. When there was only one frame deployed this occurred every two weeks.

After removal of the frames, data of all equipment was tested. For the frame at the sill of Deurganckdok, the Argus turbidity rod measured 20 samples per cycle with a sample interval of 5s with a pause of 500s between successive cycles, obtaining a total cycle time of 10 minutes. During the first deployment (09/02/2007 – 21/02/2007) the instrument only measured for two days, the second deployment (21/02/2007 – 07/03/2007) only three days. Consequently the ARGUS was replaced by an other one and brought back to the office to do some tests. For the rest of the measurement period all sensors worked properly, the tilt meter indicates a good horizontal position of the frame (tilt less than 8°). The Altus echosounder and the Aanderaa RCM9, both with a measurement cadence of 10 minutes, worked properly. Even though on the 4th of April the Aanderaa RCM9 seemed to bad installed during deployment. Due to this there was decided to recover/deploy the frame again two days later, so on the 6th of April an other RCM9 was placed on the frame. The Valeport MIDAS OBS3+ measured properly until the 6th of April 2007. Afterwards the power supply broke off, so no data was obtained anymore. Furthermore the data from the 4th until the 6th of April was lost, since no data was downloaded on the 4th. One measurement cycle of the Valeport took 10 minutes (100 samples were taken at a rate of 1 sample per second and a pause of 500s).

Concerning the frame at the downstream edge of Deurganckdok (CDW) the instruments measured with the same tuning as the Sill frame. The Altus, the Aanderaa RCM9 and the MIDAS OBS3+ worked properly until the 5th of April 2007. A good horizontal position (tilt less than 5°) is shown by the RCM9 until this day. Between 12h40 and 15h52 tilt runs up from 1° to 42°, which indicates collapsing of the frame. This means that data obtained afterwards is not useful. No mechanical damage was observed after removal of the frame, neither on the frame itself, neither on the measurement equipment or sensors. Concerning the ARGUS, the instrument first used and later replaced on the Sill frame was placed on this frame, since tests of the instrument at the office didn't show any problems. But once deployed, again the instrument failed. Hence the instrument was sent back to the manufacturer to find out about the problem. Intensively testing by the manufacturer finally showed that there was a problem in the insulation between the OBS sensor array and the steel rod in very salty water and under high pressure. Consequently water got under the electronic.

An overview of the measurement locations is given in Table 3-4, while a chronological overview of measured data with an explanation can be found in Table 3-5.

Table 3-4: Overview of the measurement locations (UTM50) and periods

Near bed continuous monitoring			
Location	*Easting (UTM ED 50)*	*Northing (UTM ED 50)*	*Period*
Deurganckdok CDW	588685	5684880	15/03/2007 – 12/04/2007
Deurganckdok Sill	588805	5684170	09/02/2007 – 18/04/2007

Table 3-5: Chronological overview of missing and faulty data

Deurganckdok Sill			
Period	***No data***	***Faulty data***	***Comment***
09/02/2007			Deployment
10/02/2007 – 21/02/2007	ARGUS		Instrument failing
21/02/2007			Recovery/Deployment
24/02/2007 – 07/03/2007	ARGUS		Instrument failing
07/03/2007			Recovery/Deployment Replacement ARGUS
21/03/2007			Recovery/Deployment
04/04/2007			Recovery/Deployment
06/04/2007			Recovery/Deployment Replacement of the RCM9, due to leakage
04/04/2007 – 18/04/2007	MIDAS OBS3+		Instrument failing
18/04/2007			Recovery
Deurganckdok CDW			
Period	***No data***	***Faulty data***	***Comment***
15/03/2007			Deployment
15/03/2007 – 28/03/2007	ARGUS		Instrument failing
28/03/2007			Recovery/Deployment
28/03/2007 – 12/04/2007	ARGUS		Instrument failing
05/04/2007 – 12/04/2007		X	Frame collapsed on side
12/04/2007			Recovery

4. PROCESSING OF DATASETS

4.1. Calibration of the sensors

A crucial aspect of the accuracy and reliability of the data concerns the calibration of the instruments before the measurement campaign. The calibration procedures and results are described in report 6.1 Winter calibration of the HCBS2 measurements (IMDC, 2006a) and report 6.2 Summer calibration of the HCBS2 measurements (IMDC, 2007a) .

4.2. Long term measurements near quay wall

A second period of the long term measurements executed at two depths (approximately -2.4 m TAW and -12.4 m TAW) at three locations on the quay walls of Deurganckdok lasted from 12 February until 27 March 2007. Depth, temperature, salinity and suspended sediment concentration have been logged. All gathered time series have been converted to appropriate engineering units and combined to form series covering the complete period. During validation erroneous data due to mid term recovery, sensor malfunction and buried equipment has been removed. In this form the data is ready for processing.

4.2.1. Factual data: Weekseries

Measurements are visualized per instrument, location and per week in APPENDIX B.

- The title shows the week number followed by the year
- The second graph depicts the salinity and temperature
- The third and last graph shows the water level at the nearest tidal gauge and the suspended sediment concentration

Faulty data is omitted from these graphs.

4.2.2. Average tidal cycle of local parameters

For all parameters measured at one location data has been organised in separate series per tidal cycle (low water to next low water). High water moments were placed on a fixed position in the series, low water moments differ in time relative to high water due to variation in flood and ebb length with neap-spring phases. In this way a time series with time relative to high water is produced for each tide. When tidal elevation data showed substantial gaps data from pressure gauges was used to divide the long series into tidal series.

By defining average tidal amplitude A for neap, average and spring tides, it becomes possible to classify tidal cycles in three categories in the following way:

$$Neap: A \le \alpha(A_{neap} + A_{aver})$$

$$Spring: A \ge \alpha(A_{spring} + A_{aver})$$

$$Average: \alpha(A_{neap} + A_{aver}) < A < \alpha(A_{spring} + A_{aver})$$

where: A_{neap}, A_{aver} and A_{spring} are average amplitudes

α is a factor to decide where to distinguish between categories (here taken as 0.5)

Using such categorisation the tidal series can be grouped in neap, average and spring tides. Within these groups an average is made per parameter per tidal phase relative to high water (Figure 4-1). In this way an average neap tidal cycle, an average middle tidal cycle and an average spring tidal cycle is obtained for all parameters.

The same exercise is repeated for relative values, which are the measured values divided by the tidal average (the average parameter value for that particular tidal cycle). All three types are shown in one plot with a plot for salinity, sediment concentration and temperature per page in APPENDIX G1.

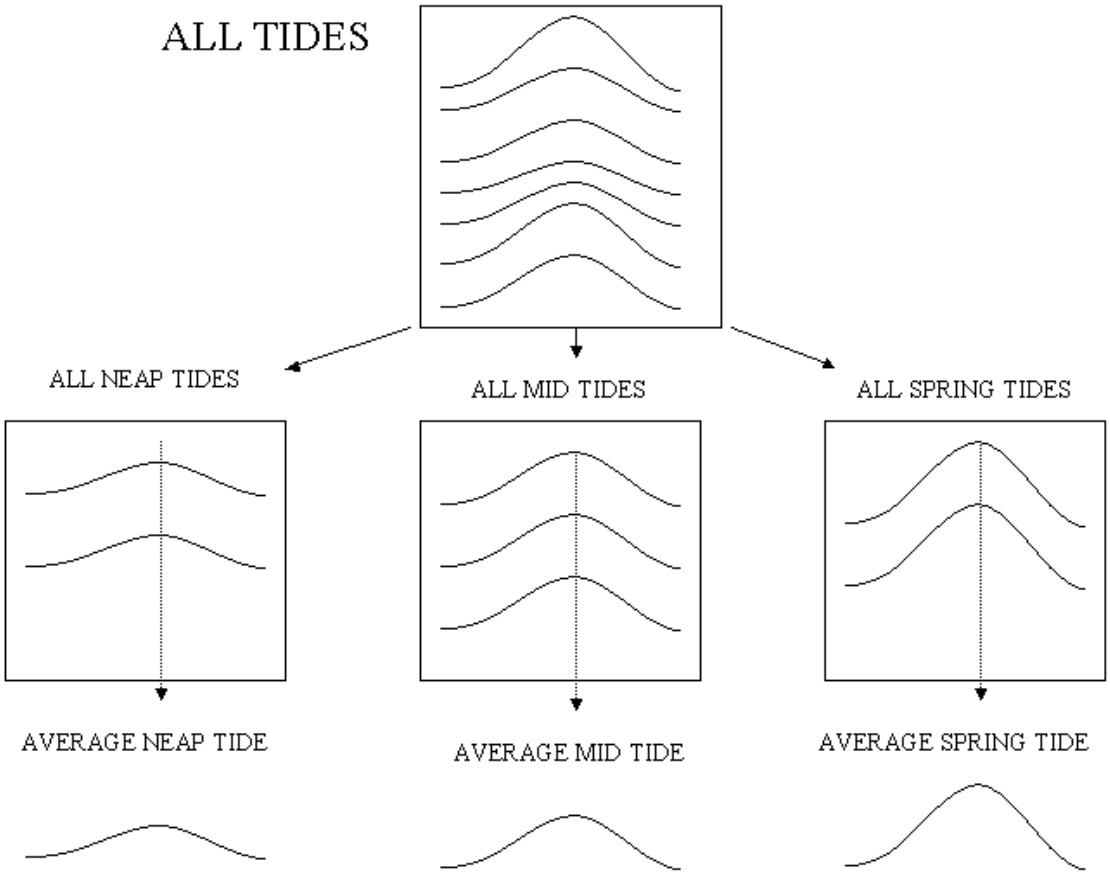

Figure 4-1: Categorisation of tidal tidal cycles

4.2.3. Average tidal cycle of gradients

For each of the three parameters being processed, four horizontal gradients (along dock's axis and cross dock, each at two depths) and three vertical gradients (one per location) have been calculated. The gradient along Deurganckdok was obtained by the difference of measurements between locations P&O2 (S-ENTRANCE) and P&O1 (S-BACK) (P&O1 minus P&O2) , the gradient across Deurganckdok was calculated as the difference between locations P&O2 (S-ENTRANCE) and PSA (N-ENTRANCE) (PSA minus P&O2). For each of the locations a vertical gradient has been calculated from the difference between the measurements at –2.4 m TAW and the measurements at –12.4 m TAW (-12.2 m data minus –2.4 m data).

The time series of gradients obtained as such have then been processed following exactly the same tidal separation technique as for the local parameters (described in 4.2.2). The results are shown in APPENDIX G2.

4.3. Near bed continuous monitoring

4.3.1. Methodology of processing the ARGUS ASM-IV data

The data gathered by the ARGUS ASM-IV during the measurements was processed with the ASMA 3.11 software (provided by ARGUS UMWELT-MEATECHNIK).

Raw data files are loaded in combination with the appropriate calibration file. This file is set up during the calibration. Finally only the data at the beginning and the end of the time series (apparatus not submerged) needed to be removed.

Time series, which show the sedimentation profile measured by the 96 sensors, can be found in APPENDIX C. In these plots the time axis shows MET-time. Also a table showing average values for SS concentration per tidal phase is shown. All sensors are organized per 10 (except top 6 are together) and averaged over flood and ebb phases. An average tidal phase (i.e. tidal phase with an average tidal difference) is also shown for every deployment period in APPENDIX C.

4.3.2. Methodology of processing the Altus data

The Altus data were validated and processed. Outliers were screened and removed.

The ALTUS gathers echo-signals at 4 different threshold values. The maximal echo value is used as a reference value for the hardness of the bottom. When the echo signal exceeds certain percentage of this emitted signal strength, a high percentage (70%) threshold will give an indication of the hard bottom, lower percentage threshold values (11%, 23%, 39%) indicate various levels in the soft bottom with a decreasing 'density'. Increasing distances indicate a net erosion, decreasing distances a net sedimentation. The differences between the 4 signals at one given time and measurement give an indication on the 'firmness or solidity' of the soft bottom. These differences are hard to quantify and are more to be analysed qualitatively. Table 4-1 shows the threshold values used and their colour in the graphs.

Week series are shown in APPENDIX C together with the ARGUS week series. Altus datasheets show values for all measured signals including the tide at a nearby tidal station (Liefkenshoek).

A table is added with the Altus Echosounder-Bottom distances of every signal for each High Water (HW) and Low Water (LW). An average tidal phase is also shown for every deployment period in APPENDIX C.

Table 4-1: Overview of the used threshold values for the Altus Echosounder

Legend name used	***Threshold value [% of Signal]***	***Colour in the graph***
Signal 1	11%	Red
Signal 2	23%	Green
Signal 3	39%	Blue
Signal 4	70%	Black

4.3.3. Multiprobes: RCM9 and Valeport data

RCM9 and Valeport MIDAS OBS3+ data were validated and processed. Outliers were screened and removed.

Velocities were computed with a reference to the magnetic North.

Datasheets in APPENDIX D gives the '2 days'-series of RCM9 and Valeport data:

- Velocity Magnitude and Direction of UP sensors (RCM9)
- Velocity Magnitude and Direction of DOWN sensors (Valeport)
- Suspended Sediment Concentration of UP (blue) and DOWN (red) sensors. Tidal height is included together with these parameters from the nearest tidal station (Liefkenshoek)
- Absolute Suspended Sediment Flux of UP (blue) and DOWN (red) sensors. Tidal height is included together with these parameters from the nearest tidal station (Liefkenshoek)

The Absolute Suspended Sediment Flux is not defined for a defined cross-section. It is an absolute flux (Velocity Magnitude x SS Concentration).

In APPENDIX D tables are showing average values for Velocity Magnitude, Direction, SS Concentrations and Absolute Fluxes for both UP and DOWN sensors per tidal phase (ebb/flood).. An average tidal phase is also shown in APPENDIX D.

In APPENDIX E the suspended sediment concentration measured by the RCM9 and Valeport sensors (blue) was compared to the suspended sediment concentration measured by the ARGUS sensors (red) at the same height: This only for the Sill frame, due to lack of data from the ARGUS installed to the CDW frame.

- For the Sill frame, the UP sensor was located at 1 m above the bottom and was compared to the ARGUS sensor 16, which resided at the same depth.
- For the Sill frame, the DOWN sensor was located at 0.1 m above the bottom and was compared to the ARGUS sensor 96, which was located at 0.20 m above the bottom.

Tidal height is included together with these parameters from the nearest tidal station (Liefkenshoek).

In APPENDIX E tables are showing average values for SS Concentrations of both Argus and RCM9 and Valeport sensors per tidal phase (ebb/flood). An average tidal phase is also shown in APPENDIX E.

5. PRELIMINARY ANALYSIS

5.1. Long term salinity measurements 12/2/2007 – 27/3/2007

For each of the three locations salinity, sediment concentration and temperature have been logged at two depths. Apart from week series of every parameter, average tidal cycles have been determined for each parameter. This was done for absolute and relative values, as well as for horizontal gradients along and across the dock, and vertical gradients (APPENDIX **G**). All of these results are discussed below.

5.1.1. Week series

5.1.1.1. P&O 1 (S-BACK)

Salinity measured around 7 ppt at the start of the measurement campaign and gradually decreased to a minimal value of approximately 2.5 ppt on 14-15 March. Simultaneously, the tidal variation faded away too. On 16 March, the initial salinity pattern recovered. As will be discussed in §5.1.2.1, salinity variation indeed follows the neap-spring tide variation, superimposed on the daily tides.
The water temperature gradually increased from approximately 8°C to more than 10°C by mid-March. It subsequently slightly decreased and stabilised just below 10°C.
The near water surface suspended sediment concentration at the landside of the dock was in the range of 50-100 mg/l. Instead, bottom concentrations were much larger. A base concentration was observed between 50 and 150 mg/l. Large peaks of up to 1000 mg/l were seen, which considerably exceeded the surface peak concentrations.

5.1.1.2. P&O 2 (S-ENTRANCE)

Measured salinities show only slight tidal fluctuations near the bottom (-13 m TAW); the tidal variation was more pronounced near the water surface (-2.2 m TAW) though. During the measurement campaign the salinity gradually decreased from approximately 8 ppt (at 27 February) to 2.5 ppt, to slowly increase again on 16 March to a value of just below 5 ppt. Instead, water temperature increased from 7.5-8°C up to 10°C by 14 March. By March 20, temperature dropped again to approximately 9°C.
Near the bottom of the dock the suspended sediment concentration followed the tidal variation. However, this behaviour faded away from February 26 on, and it could be seen again from March 13 on. The period in between was characterised by no or only small peaks in concentration. Outside this period, concentration peaks measured up to 800 mg/l. Near the water surface smaller peaks with concentrations generally being below 300 mg/l occurred. The base suspended sediment concentration at the bottom was below 100 mg/l.

5.1.1.3. PSA (N-ENTRANCE)

Near the bottom salinity measured around 5 ppt, which gradually dropped to a value of approximately 2.5 ppt and subsequently increased again to its original value in the period 2-18 March 2007. Minima of salinity were observed at low tide of every tidal cycle. Near the water surface (at -2.3 m TAW) salinity showed a more pronounced tidal behaviour.
Temperature was observed to be 7.5-8°C, which slightly increased to approximately 10°C at the end of the measurement campaign.
The time series of bottom suspended sediment concentration was generally characterised by peak values of up to 1000 mg/l at flood tides. The base sediment concentration was below 100 mg/l though. Fewer peaks seemed to occur in the period between 9 and 17 March. Note also that the

sediment concentration peaks were less pronounced near the water surface and showed values up to 400-800 mg/l SSC.

5.1.2. Average tidal cycles

Plots of averaged tidal cycles can be found in APPENDIX **G**.

5.1.2.1. Local Parameters

The water temperature was rather constant for the different averaged tidal cycles and measured approximately 8-9°C. Only at P&O1 (S-BACK) temperature slightly exceeded 10°C at neap tides.

Salinity also showed small values in the range of 2-6 ppt. At PSA (N-ENTRANCE) a maximum salinity occurred 1-2 hours after flood tide; it is a relatively weak tidal effect though. At the other two measurement locations, P&O2 (S-ENTRANCE) and P&O1 (S-BACK), hardly any variation in salinity was observed.

In comparison with salinity and temperature, suspended sediment concentration showed the largest variation over an average tidal cycle. The plots in APPENDIX **G** clearly indicate the occurrence of a concentration peak at 0-2 hours after flood tide. Obviously, the largest concentration could be observed at spring tide; near the bottom of the dock at PSA (N-ENTRANCE) the suspended sediment concentration measured up till 550 mg/l. At P&O1 (S-BACK), concentrations were rather constant for the average tidal cycles. This especially counts at neap tide. Note that near the surface (-2.2 m TAW) at the P&O2 (S-ENTRANCE) location a first peak occurred before flood tide.

5.1.2.2. Gradients

Cross-dock gradients from P&O 2 (S-ENTRANCE) towards PSA (N-ENTRANCE) have been calculated at both –2.2 m TAW and –12 m TAW. In general, calculated gradients were low and close to zero. The gradients were most pronounced at spring tide. The cross-section gradient of salinity near the bottom of the dock was negative indicating that the salt concentration was largest near the southern quay. Positive gradients occurred 1-2 hours after flood tide. Although positive values could be observed for the suspended sediment concentration gradient, a similar (positive) peak gradient as for salinity was seen after flood tide for approximately 2 hours. Larger water temperatures were measured at the southern quay wall in comparison with the northern quay. Again, the opposite counted for 0-2 hours after flood tide.
Closer to the water surface at the dock entrance gradients varied more compared to the bottom gradients. The change of suspended sediment concentration near the water surface after flood tide was more pronounced. Again, the salinity and the temperature showed a positive cross-dock gradient just before and after flood tide. However, the positive gradient persisted longer in time: 4 and 6 hours for the salinity and temperature respectively.

Along-dock gradients run from the entrance towards the inland end of the dock. From the observations it is clear that salinity and temperature gradients are negligible both at the bottom and the surface. Although very small and positively valued in general, a negative temperature gradient was observed for 2 hours prior to flood tide, i.e. the water temperature at the back-end of the dock was larger than at the entrance. During spring tide, this effect was reduced though. Comparable to the temperature gradients, salinity showed negative gradients too before flood tide occurred in time. Here, negative gradients prevailed 4 hours prior to flood tide and lasted another hour after it.
From the measurements, it was seen that the bottom suspended sediment concentration gradient was positive for the entire tidal cycle. In other words, the sediment concentration near the bottom of the dock was smaller near the entrance in comparison to the inland side of the dock. The gradients for suspended sediment concentration were more pronounced near the water surface; there, a significant peak in gradients could be seen at flood tide. Positive gradients were observed after flood tide too, which indicated the occurrence of larger concentrations further inside the dock.

Vertical gradients were very small for both salinity and temperature. Temperature gradients only showed positive gradients at the landside end of the dock. Observed salinity gradients had the same order of magnitude at all measurement locations: they were always positive and small too. The suspended sediment concentrations were significantly larger at the bottom entrance though, with a peak value around flood tide. At PSA (N-ENTRANCE) vertical sediment concentration gradients measured up to 3 mg/l/m at spring tide, whereas P&O1 (S-ENTRANCE) was characterised with values of up to approximately 1.5 mg/l/m. Inside the dock, positive sediment concentration gradients prevailed and measured around 2 mg/l/m.

5.1.3. Comparison with previous measurements

In comparison to the previous measurement campaign (see IMDC (2007i), Appendices), the range of suspended sediment concentrations is similar. The salinity range is significantly lower though (range of 8-25 ppt during the summer 2006 measurement campaign). However, the salinity range is comparable to the salinities observed in the spring of 2006 (range of 5-11 ppt). Temperature variability is comparable to both spring and summer 2006 campaigns; its range is similar to spring 2006.

With respect to the averaged tidal cycles, it seems that most phenomena from this campaign correspond to those of the summer 2006 observations. Near the entrance of the dock, the present suspended sediment concentrations show a more pronounced peak close to the water surface and the bottom though.

With respect to the parameter gradients, many similarities can be seen between the different measurement campaigns. However, it is also observed that during the present measurements a more pronounced near-surface suspended sediment concentration peak occurred at spring tide at the dock entrance, i.e. larger concentrations prevail at PSA (N-ENTRANCE) in comparison with P&O2 (S-ENTRANCE). Along the dock, a larger negative sediment concentration gradient is observed in comparison with the summer 2006 campaign; hence, the concentration change along the dock is more significant in the present case.
With respect to the vertical gradients, salinity and temperature gradients have a similar range of observed values. The vertical gradients for sediment concentration are comparable to those observed in summer 2006, whereas they largely deviate (being much lower) from the spring 2006 measurement campaign.

5.2. Near bed continuous monitoring 19/4/2006 – 23/5/2006

5.2.1. CDW frame data

It appears from the recorded data that the bottom is situated about 57 cm below the Altus sensor for the first deployment, respectively 32 cm for the second deployment. Depending on the deployment this can vary a little. (see weekseries APPENDIX C). Furthermore some datasheets show slight sedimentation after every high water.

Since there were some problems with the ARGUS installed on this frame, no data was gathered in the vicinity of the CDW with this instrument.

Average velocities per tidal phase (ebb/flood) 1 m above the bed vary from 0.1 up to 0.5 m/s, 0.1 m above the bed they vary from 0.2 up to 0.4 m/s (Figure 5-1). Average SS concentrations measured by the upper sensor are about 3 times smaller than those measured by the lower sensor (Figure 5-2).

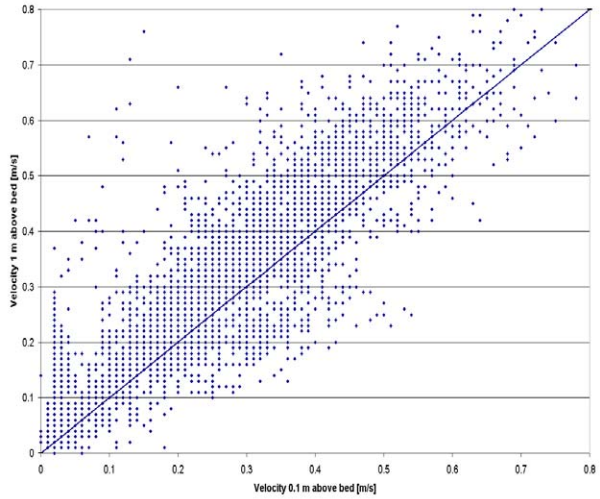

Figure 5-1: Near bed current velocities (15/03/2007 - 12/04/2007) CDW frame

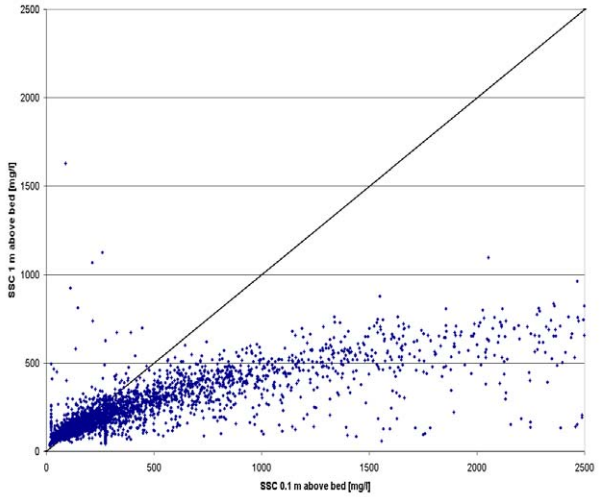

Figure 5-2: Near bed SS concentrations (15/03/2007 - 12/04/2007) CDW frame

5.2.2. Sill frame data

Average concentrations per tidal phase in layers of 10 cm, measured by the ARGUS vary from 0.2 to 465 mg/l. The highest concentrations occur in the lowest cm of the water column as to be expected. During flood suspended sediment concentrations are higher than those measured during ebb.

It appears from the recorded data that the bottom is situated between 22 cm and 45 cm below the Altus sensor. Depending on the deployment this can vary a little (see weekseries APPENDIX C). Furthermore it seems that some sedimentation occurs.

Average velocities per tidal phase (ebb/flood) 1 m above the bed vary from 0.1 up to 0.3 m/s, 0.1 m above the bed they vary from 0.1 up to 0.2 m/s (Figure 5-3). Average SS concentrations measured by the upper sensor are somewhat smaller than those measured by the lower sensor (Figure 5-4). When comparing the sensors to the ARGUS sensors at the same height, it seems that the ARGUS gives lower values (1.7 times lower for upper sensor, see Figure 5-5 & respectively 2.5 times for the lower sensor, see Figure 5-6). However there should be kept in mind that for the lower sensors the Valport is mounted to the frame at a lower level than the last sensor of the ARGUS. For the uppermost sensors, depending on the deployment some slight changes in height of the RCM9 turbidity sensor may occur.

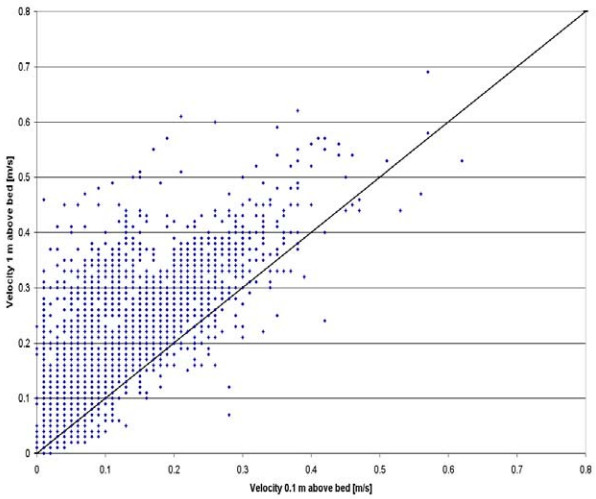

Figure 5-3: Near bed current velocities (09/02/2007 - 18/04/2007) Sill frame

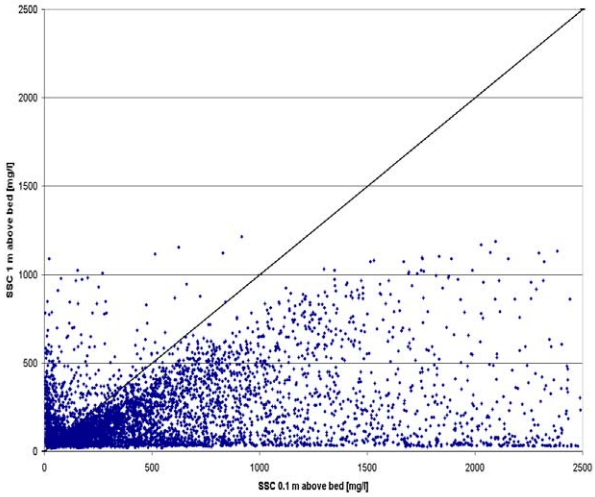

Figure 5-4: Near bed SS concentrations (09/02/2007 - 18/04/2007) Sill frame

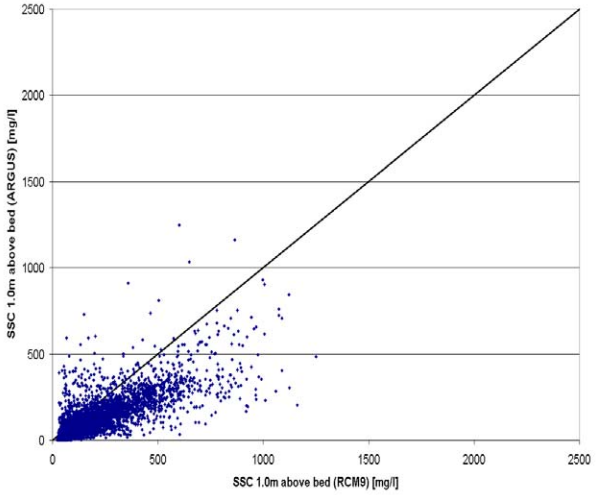

Figure 5-5: ARGUS vs. Aanderaa RCM9 - 1m above bed Sill Frame

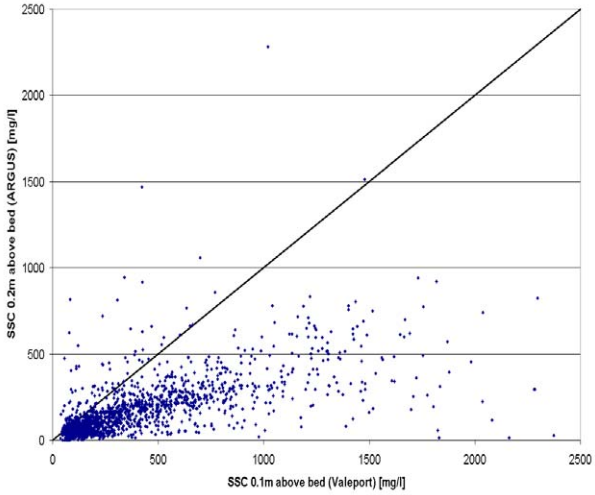

Figure 5-6: ARGUS vs. Valeport - 0.2m resp. 0.1m above bed Sill frame

5.2.3. Comparison with previous measurements

Previous measurements at the same locations were executed as part of the HCBS project (17/02/2005 – 03/03/2005, 14/03/2006 – 05/04/2006) and as part of this project for the measurement campaign in the spring (19/04/2006 – 23/05/2006) and in the summer (18/07/2006 – 11/10/2006). The frame measurements of this winter measurement campaign will be compared to the spring measurements and the summer measurements of last year as part of the Deurganckdok project. Comparison will be made for a period of comparable tidal amplitudes (22/04/2006 – 05/05/2006 & 07/08/2006 -18/08/2006 & 17/03/2007 – 28/03/2007).

Table 5-1 gives an overview of the abbreviations used in the figures for the comparison of the measurement campaigns of the Deurganckdok project. Also the measurement period is given.

Table 5-1: Measurement period and abbreviations used for the comparison of the frame measurements of the Deurganckdok project

Measurement campaign	***Period***	***Abbreviation***
Spring measurements 2006	19/04/2006 – 23/05/2006	DGD Spring
Summer measurements 2006	18/07/2006 – 11/10/2006	DGD summer
Winter measurements 2007	09/02/2007 – 18/04/2007	DGD winter

5.2.3.1. CDW frame

For the CDW frame bottom variations for a period of comparable tidal amplitudes are very alike for all measurements. Average echosounder – bottom distances seem to be larger for the winter measurements (Figure 5-7). Notice that during the winter measurements the Altus was mounted to the frame about 8 cm higher than during spring and summer measurements. This means that the distances measured during winter are almost the same as those measured during spring.

Comparing average suspended sediment concentrations measured 1 m above the bed (RCM9), during a period of comparable tidal amplitudes, it seems that higher values are measured during this winter measurement campaign (Figure 5-8), but are comparable to the spring measurements. Average velocities 1m above the bed are more or less the same as during the spring and the summer measurement campaign (Figure 5-9). Average suspended sediment concentrations and average velocities measured 0.1m above the bed (Valeport) seem to be slightly higher than during spring measurements (Figure 5-10 & Figure 5-11). During summer measurements no data was obtained due to problems with the Valeport (IMDC 2006n). During all measurements RCM9 and Valeport were mounted to the frame at exactly the same height.

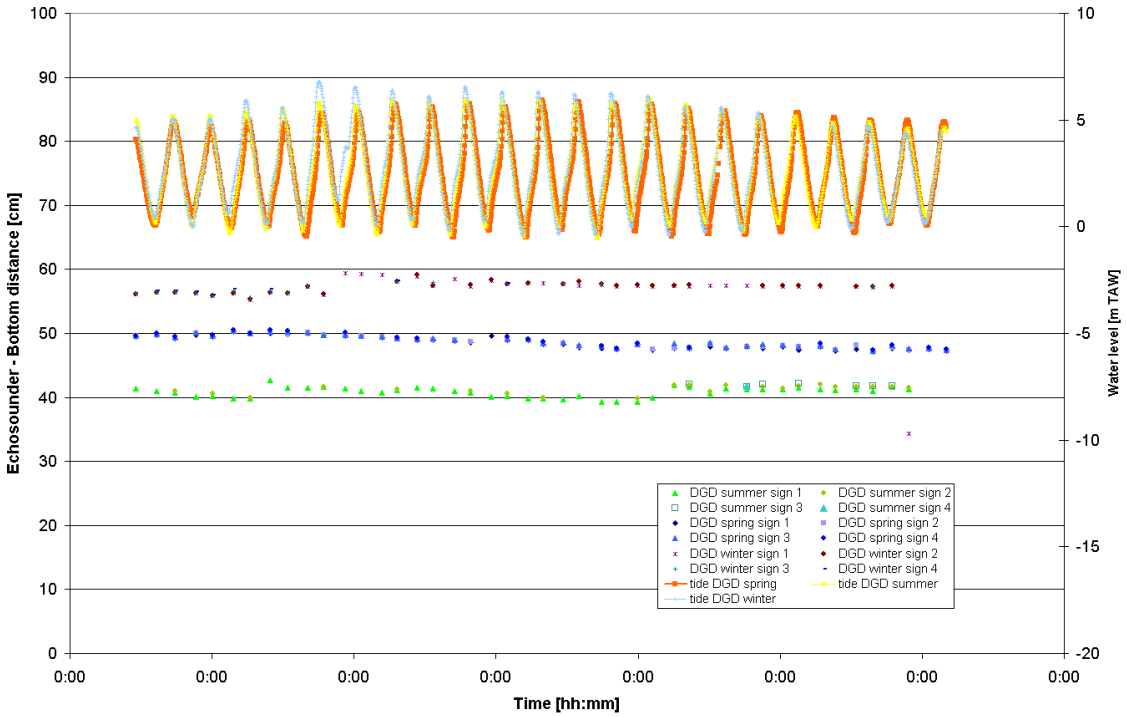

Figure 5-7: Echosounder - bottom variation for each HW/LW (DGD winter vs. DGD spring and DGD summer) [CDW frame]

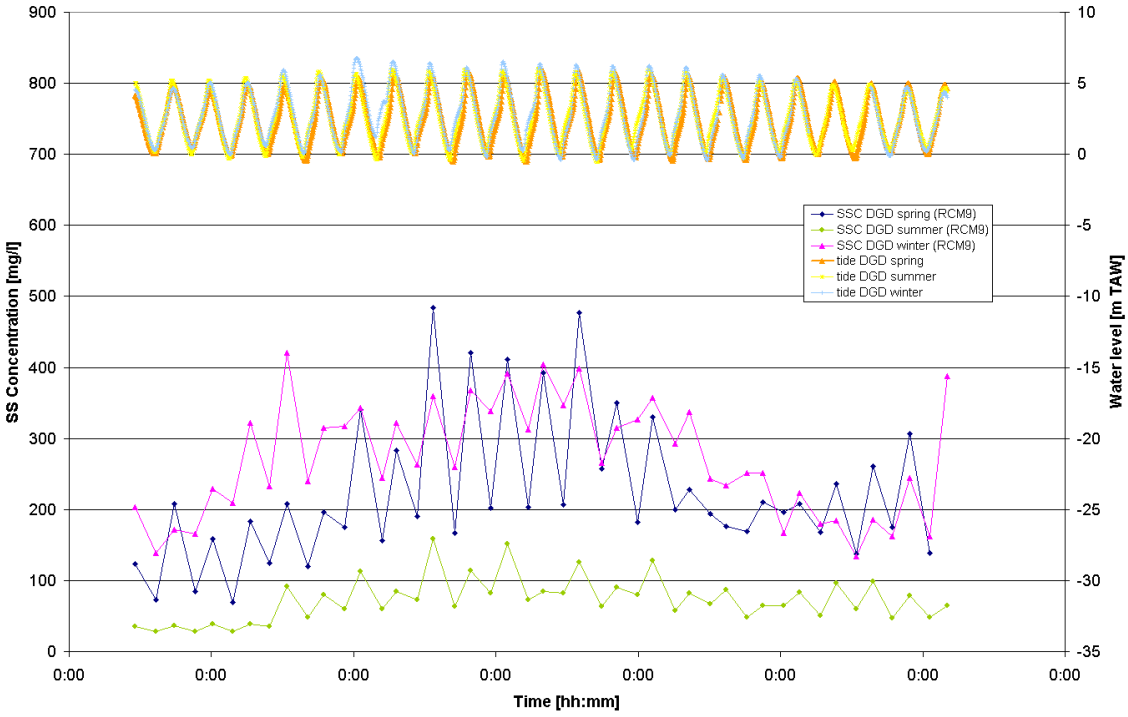

Figure 5-8: Average concentration per tidal phase 1.0m above the bed (DGD winter vs. DGD spring and DGD summer) [CDW frame]

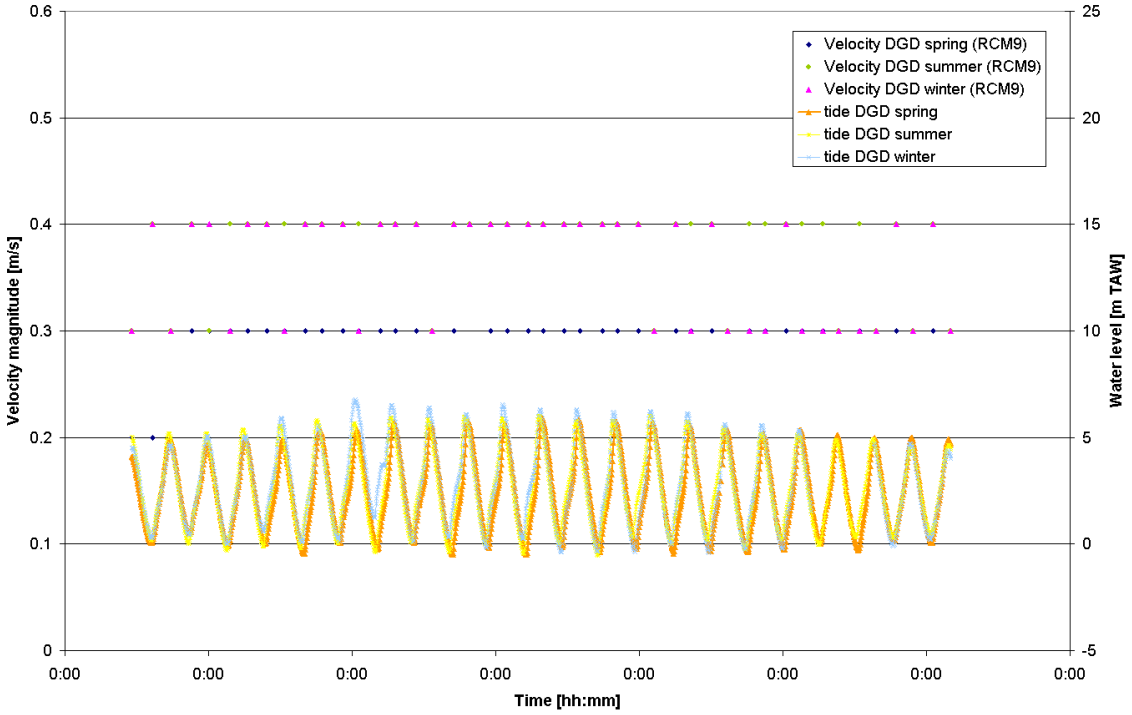

Figure 5-9: Average velocity magnitude per tidal phase 1.0m above the bed (DGD winter vs. DGD spring and DGD summer) [CDW frame]

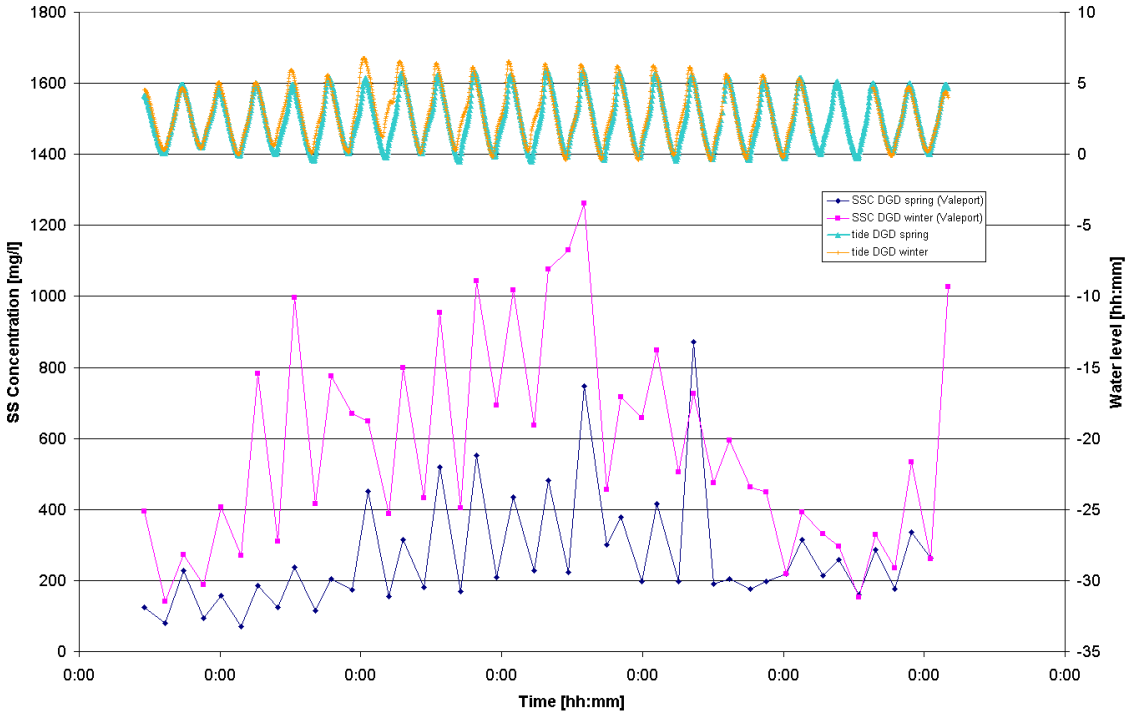

Figure 5-10:Average concentration per tidal phase 0.1m above the bed (DGD winter vs. DGD spring) [CDW frame]

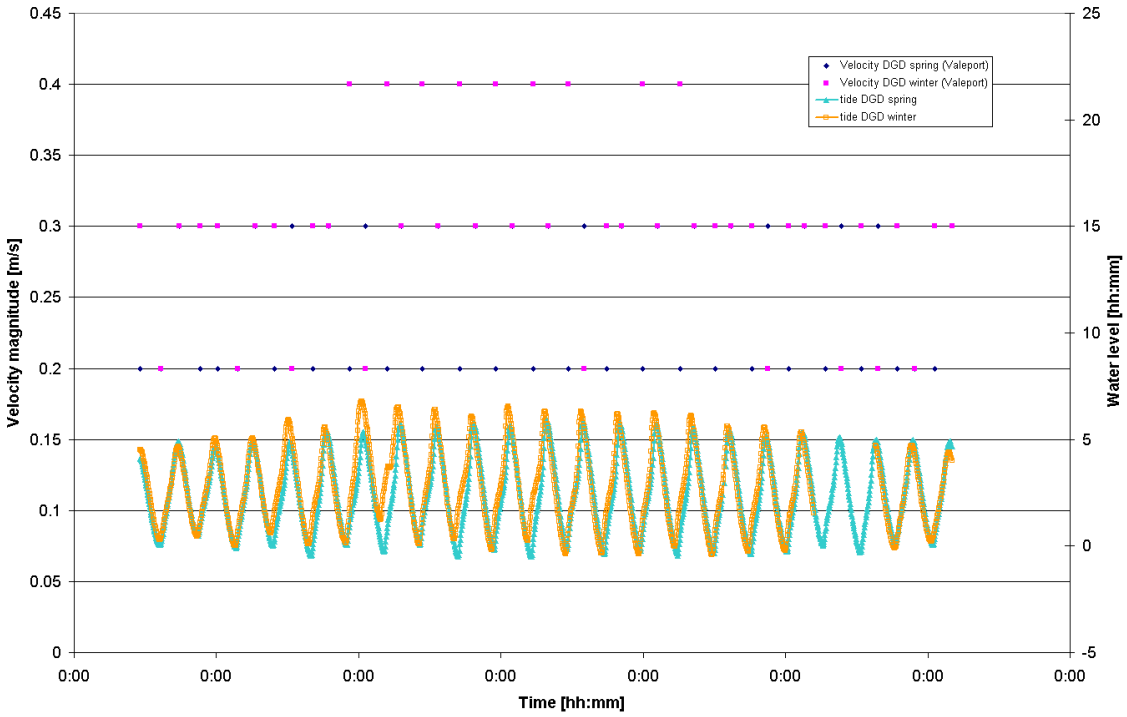

Figure 5-11: Average velocity magnitude per tidal phase 0.1m above the bed (DGD winter vs. DGD spring) [CDW frame]

5.2.3.2. Sill frame

Concerning the Sill frame, the winter measurements will only be compared to the summer measurements, since during the spring measurements penetration of the Sill frame occurred (see IMDC 2006m). A different period of comparable tidal amplitudes is considered here (22/07/2006 – 31/07/2006 & 29/03/2007 – 08/04/2007).

Comparing the average concentration per tidal phase in layers of 10 cm measured by the ARGUS, for a period of comparable tidal amplitudes, there can be seen that tidal changes are similar (larger value near high water than near low water). Generally higher concentrations were measured during the winter measurements. Figure 5-12 gives a comparison of the ARGUS sensors 67 to 76 (sensor 1 = uppermost sensor). Data from the summer measurements are only given until 26/07/02006 in stead of 31/07/2006, since after the 26th of July growth on the instrument became no longer negligible. Notice that during the measurements the ARGUS was mounted to the frame at nearly the same height (3 cm lower during winter measurements).

Bottom variations are hard to compare, since large variations were measured during this measurements. Figure 5-13 gives the summer and winter measurements for comparable tidal amplitudes. Between the 29th of March and the 8th of April 2007 (period of comparison) a recovery/deployment occurred, which explains the difference in echosounder – bottom distance for the summer measurements that can be seen in Figure 5-13. During both measurements the Altus was mounted to the frame at almost the same height (2 cm higher during winter measurements).

When comparing average suspended sediment concentrations measured 1 m above the bed (RCM9), during a period of comparable tidal amplitudes, it's clear that higher values are measured during this winter measurement campaign (Figure 5-14). Variations are similar but bigger. Average velocities 1m above the bed are similar during winter and summer measurements (Figure 5-15). There should be mentioned that velocity values are rounded off to one decimal, so differences in

velocity are in fact smaller than they seem in the figure. Also this instrument was mounted at almost the same height during the measurement campaigns (1cm difference).

During the period of comparable tidal amplitudes only some data was obtained by the Valeport MIDAS mounted on the Sill frame. So comparison is not done.

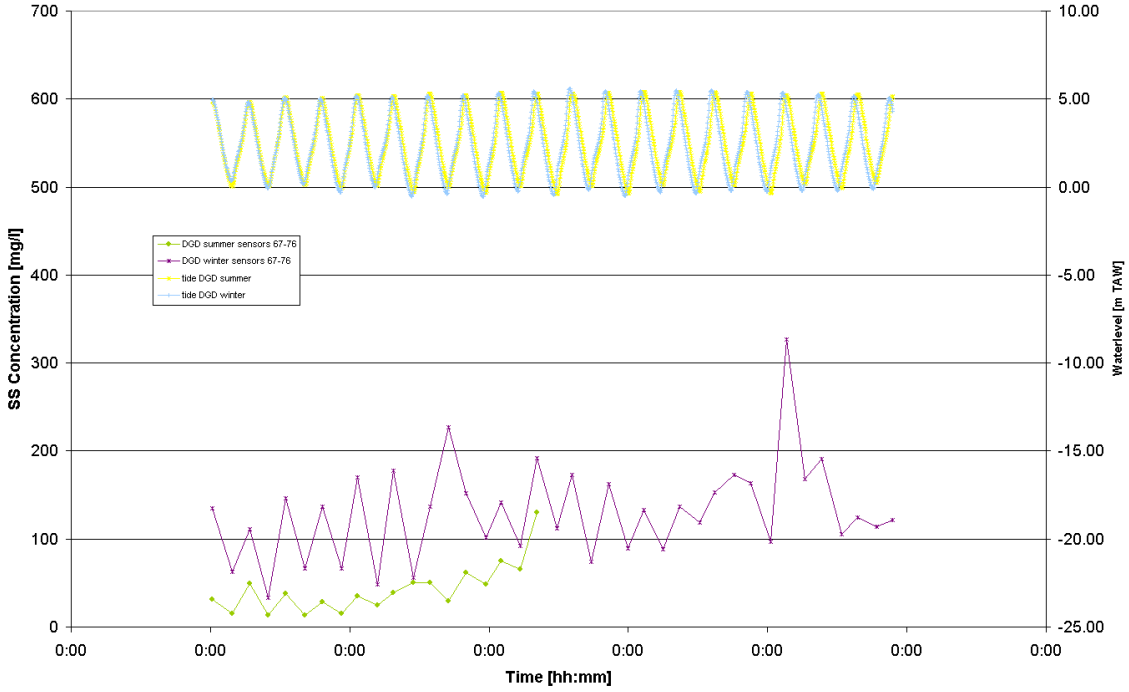

Figure 5-12: Average concentration per tidal phase for ARGUS sensors 67-76 (DGD winter vs.DGD summer) [Sill frame]

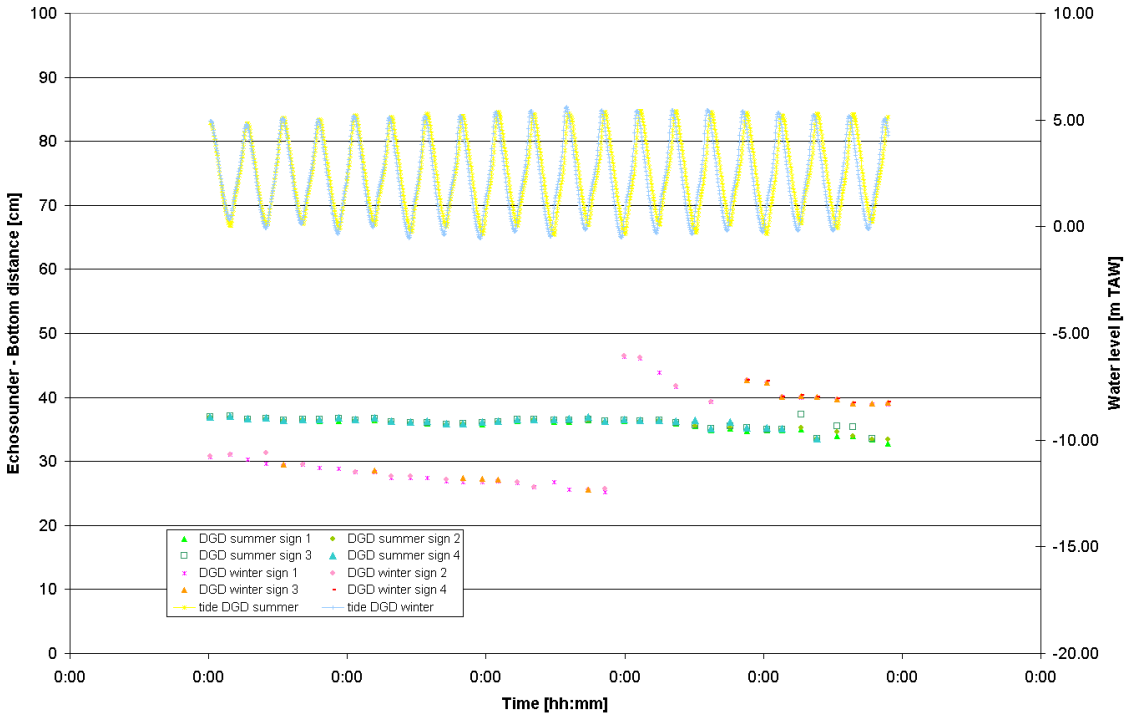

Figure 5-13: Echosounder - bottom variation for each HW/LW (DGD winter vs. DGD summer) [Sill frame]

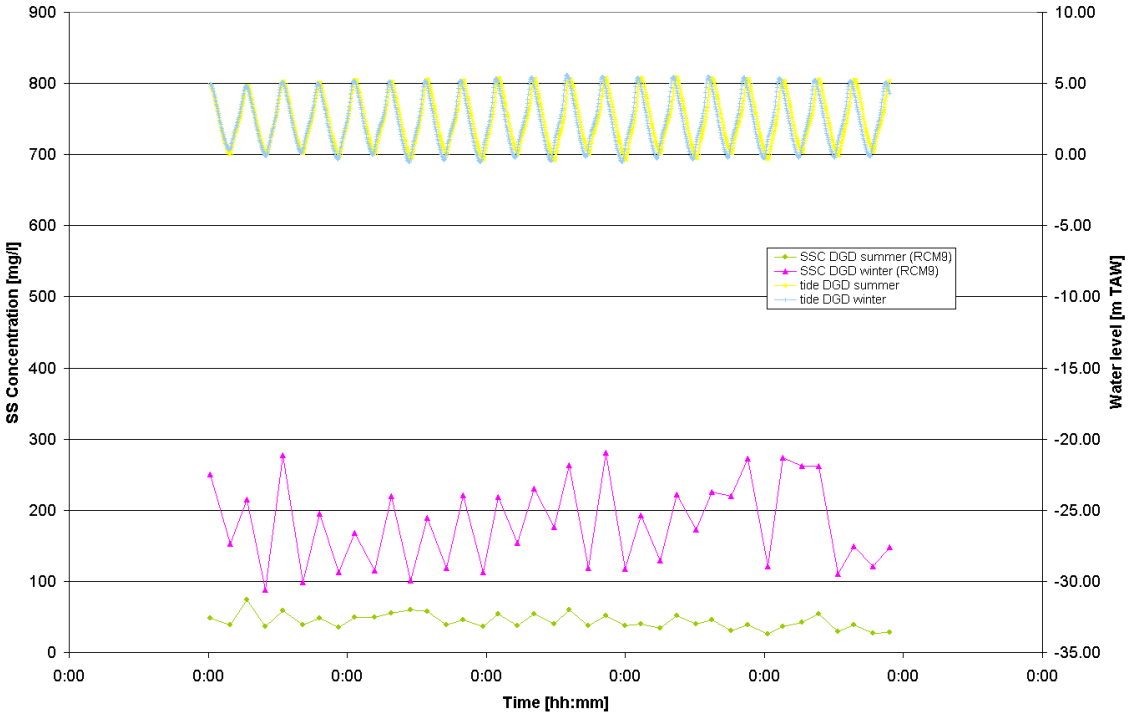

Figure 5-14: Average concentration per tidal phase 1.0m above the bed (DGD winter vs. DGD summer) [Sill frame]

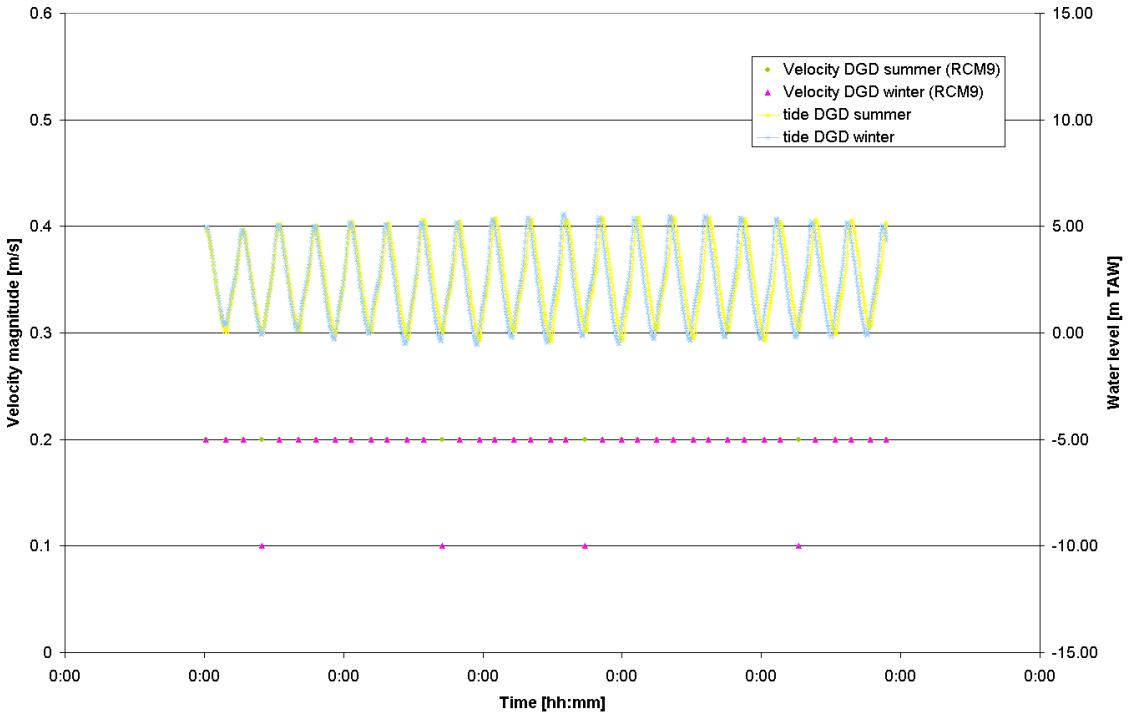

Figure 5-15: Average velocity magnitude per tidal phase 1.0m above the bed (DGD winter vs. DGD summer) [Sill frame]

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IMDC (2005e). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 2.4: Schelle 17/02/2005, I/RA/11265/05.0012/MSA.

IMDC (2005f). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 2.5: Deurganckdok 16/02/2005, I/RA/11265/05.013/MSA.

IMDC (2005g). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 2.6: Kallosluis 18/02/2005, I/RA/11265/05.014/MSA.

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IMDC (2007e) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 1.4 Sediment Balance: Three monthly report 1/1/2007 – 31/03/2007 (I/RA/11283/06.116/MSA)

IMDC (2007f) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 1.5 Annual Sediment Balance (I/RA/11283/06.117/MSA)

IMDC (2007g) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.2 Through tide measurement SiltProfiler 26/09/2006 Stream (I/RA/11283/06.068/MSA)

IMDC (2007h) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.5 Through tide measurement Sediview neap tide (to be scheduled) (I/RA/11283/06.120/MSA)

IMDC (2007i) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.7 Salt-Silt distribution & Frame Measurements Deurganckdok 15/07/2006 – 31/10/2006 (I/RA/11283/06.122/MSA)

IMDC (2007j) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.8 Salt-Silt distribution & Frame Measurements Deurganckdok 15/01/2007 – 15/03/2007 (I/RA/11283/06.123/MSA)

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APPENDIX A.

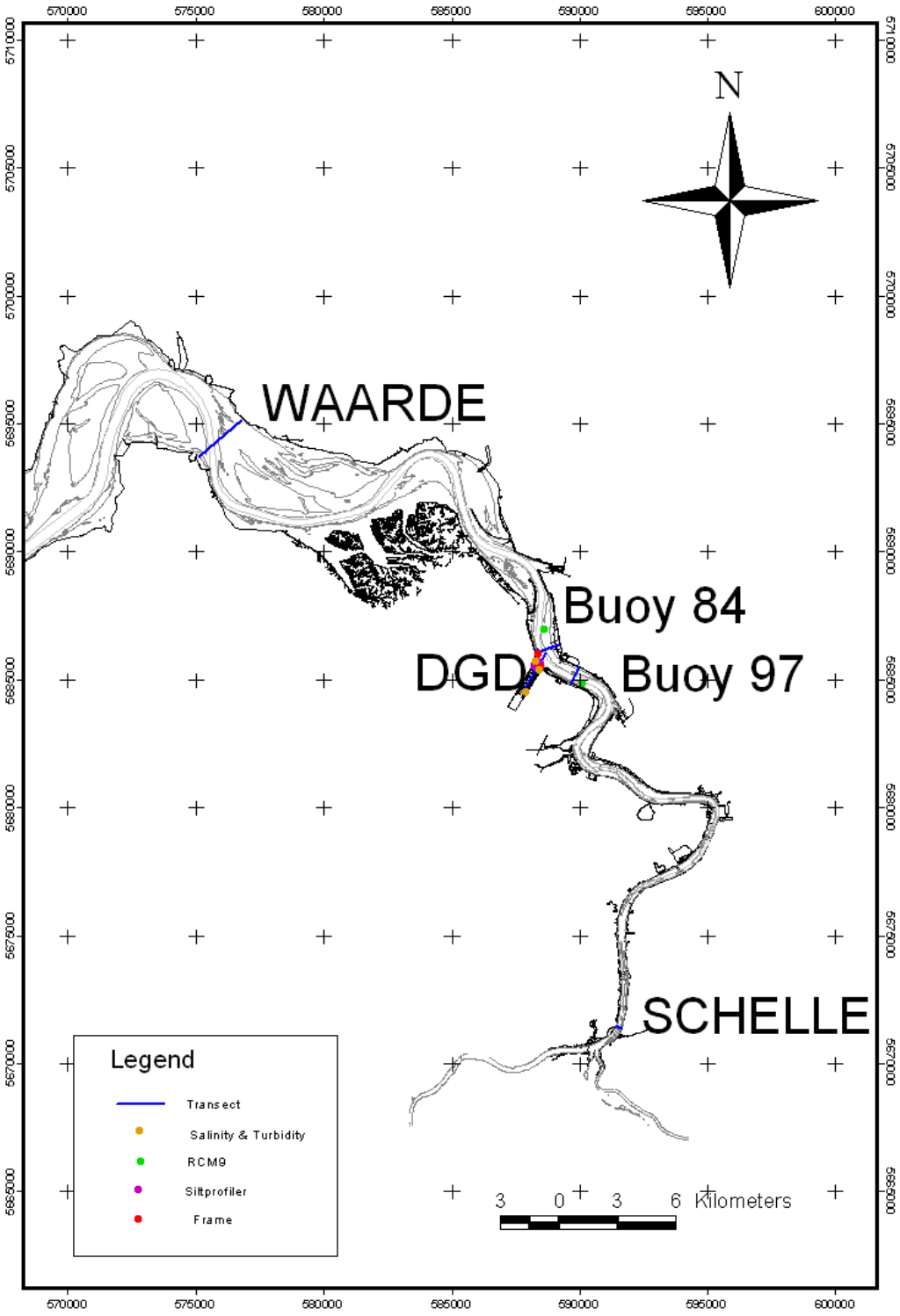
OVERVIEW OF MEASUREMENTS

A.1 Overview of the measurement locations for the whole HCBS 2 measurement campaign & DGD measurement campaign

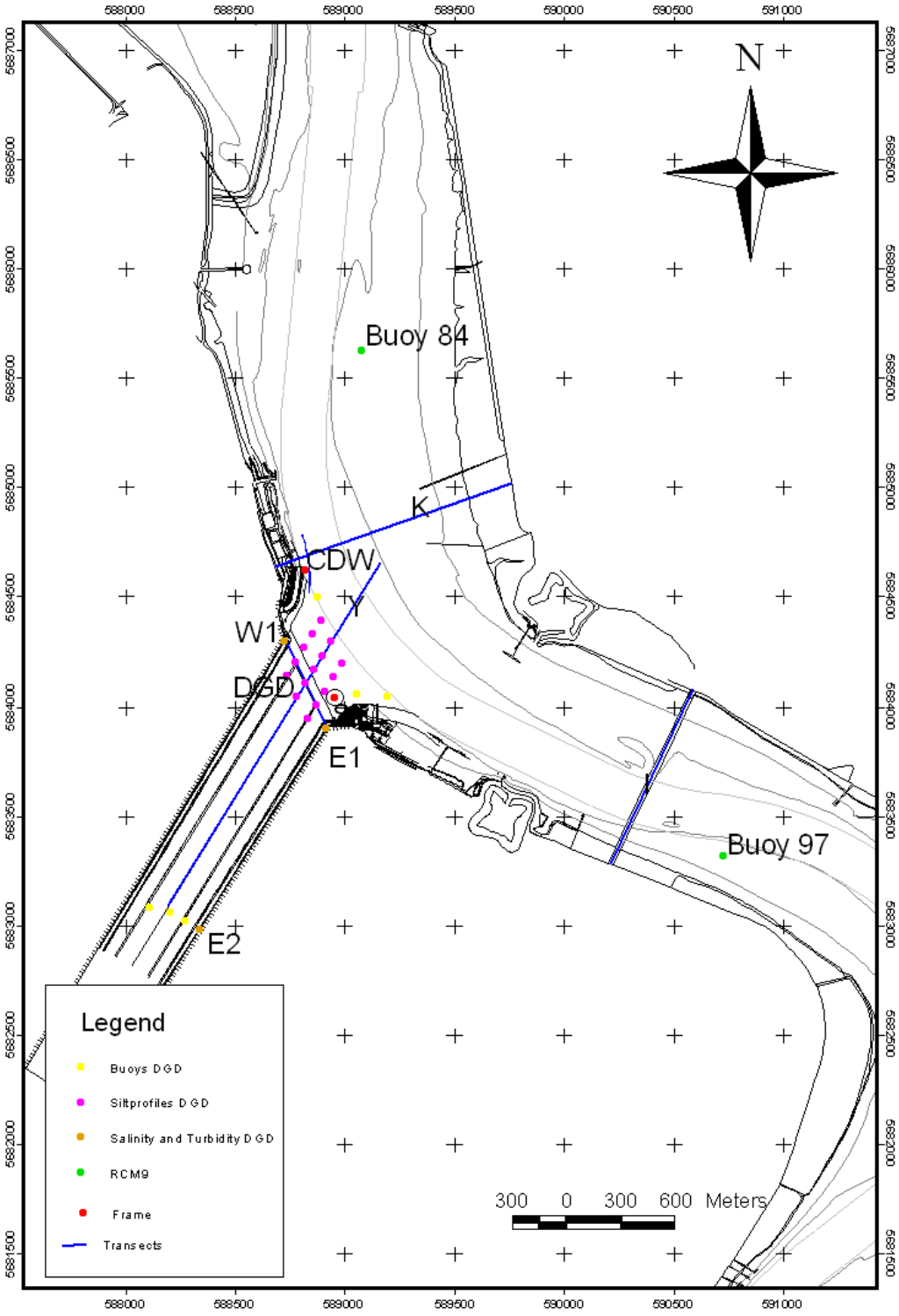
Through tide measurements: Transects					
Location	*Easting (UTM ED 50)*		*Northing (UTM ED 50)*		*Period*
Deurganckdok (in dock)	*Left Bank*	*Right Bank*	*Left Bank*	*Right Bank*	21/03/2006 & 26/09/2006
(transect Y)	*589059*	591298	*5684948*	*5683077*	
Liefkenshoek	*Left Bank*	*Right Bank*	*Left Bank*	*Right Bank*	22/03/2006 & 27/09/2006
(transect I)	590318	590771	5684257	5683302	
Deurganckdok (downstream)	*Left Bank*	*Right Bank*	*Left Bank*	*Right Bank*	22 & 23/03/2006 & 27 & 28/09/2006
(transect K)	588484	589775	5684924	5685384	
Deurganckdok (in dock)	*Left Bank*	*Right Bank*	*Left Bank*	*Right Bank*	22/03/2006 & 27/09/2006
(transect DGD)	588765	588541	5684056	5684527	
Schelle	*Left Bank*	*Right Bank*	*Left Bank*	*Right Bank*	23/03/2006 & 28/09/2006
(transect S)	592645	592953	5665794	5665682	
Waarde	*Left Bank*	*Right Bank*	*Left Bank*	*Right Bank*	23/03/2006 & 28/09/2006
(transect W)	573541	571318	5696848	5694933	
Through tide measurements: Siltprofiler gauging points					
Location	*Easting (UTM ED 50)*		*Northing (UTM ED 50)*		*Period*
Location 1: Xa	588549		5684335		21/03/2006 & 26/09/2006
Location 2: Xb	588596		5684411		
Location 3: Xc	588643		5684486		
Location 4: Xd	588690		5684562		
Location 5: Xe	588737		5684638		
Location 6: Ya	588606		5684217		
Location 7: Yb	588653		5684293		
Location 8: Yc	588700		5684368		
Through tide measurements: Siltprofiler gauging points					
Location	*Easting (UTM ED 50)*		*Northing (UTM ED 50)*		*Period*

Location 9: Yd	588747	5684444	21/03/2006 & 26/09/2006
Location 10: Ye	588793	5684520	
Location 11: Za	588662	5684099	
Location 12: Zb	588709	5684174	
Location 13: Zc	588756	5684250	
Location 14: Zd	588803	5684326	
Location 15: Ze	588850	5684402	
Near bed continuous monitoring			
Location	*Easting (UTM ED 50)*	*Northing (UTM ED 50)*	*Period*
Deurganckdok CDW	588653	5684906	14/03/2006 – 05/04/2006
Deurganckdok CDW	588685	5684880	19/04/2006 – 23/05/2006
Deurganckdok Sill	588805	5684170	19/04/2006 – 23/05/2006
Deurganckdok CDW	588685	5684880	18/07/2006 – 11/10/2006
Deurganckdok Sill	588805	5684170	19/07/2006 – 11/10/2006
Deurganckdok CDW	588685	5684880	15/03/2007 – 12/04/2007
Deurganckdok Sill	588805	5684170	09/02/2007 – 18/04/2007
Salt Silt measurements Deurganckdok			
Location	*Easting (UTM ED 50)*	*Northing (UTM ED 50)*	*Period*
P&O 1	588074	5682942	17/03/2006 – 28/04/2006
P&O 2	588767	5684045	17/03/2006 – 28/04/2006
PSA	588536	5684523	17/03/2006 – 28/04/2006
P&O 1	588074	5682942	20/07/2006 – 12/10/2006
P&O 2	588767	5684045	20/07/2006 – 12/10/2006
PSA	588536	5684523	20/07/2006 – 12/10/2006
P&O 1	588074	5682942	12/02/2007 – 27/03/2006
P&O 2	588767	5684045	12/02/2007 – 27/03/2006

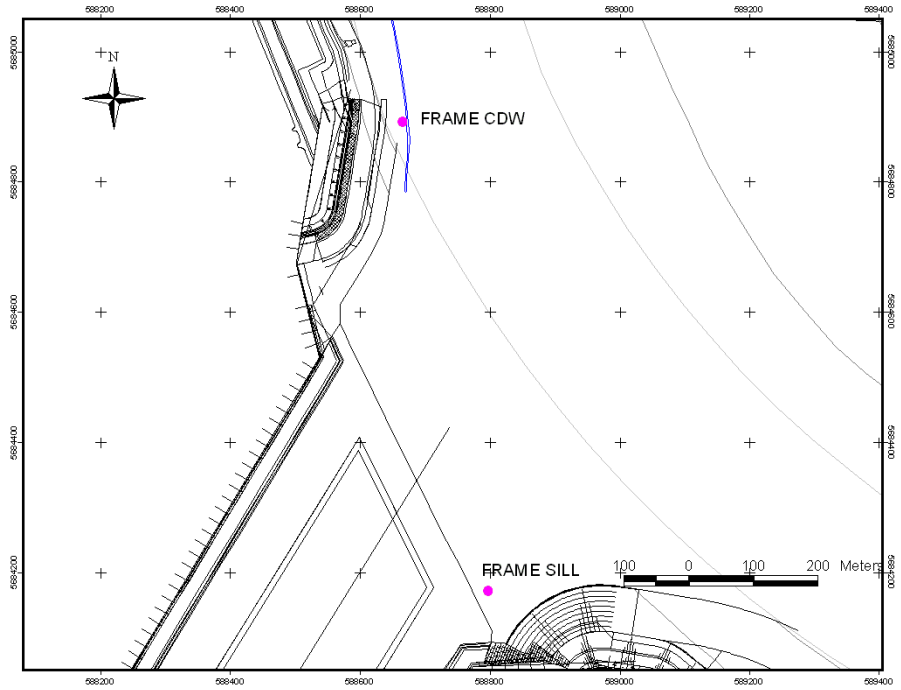
PSA	588536	5684523	12/02/2007 – 27/03/2006
Settling velocity – INSSEV			
Location	*Easting (UTM ED 50)*	*Northing (UTM ED 50)*	*Period*
Deurganckdok CDW	588717	5684898	05/09/2006
Deurganckdok SILL	588800	5684250	06/09/2006
Deurganckdok Western quay wall	588452	5684355	07/09/2006



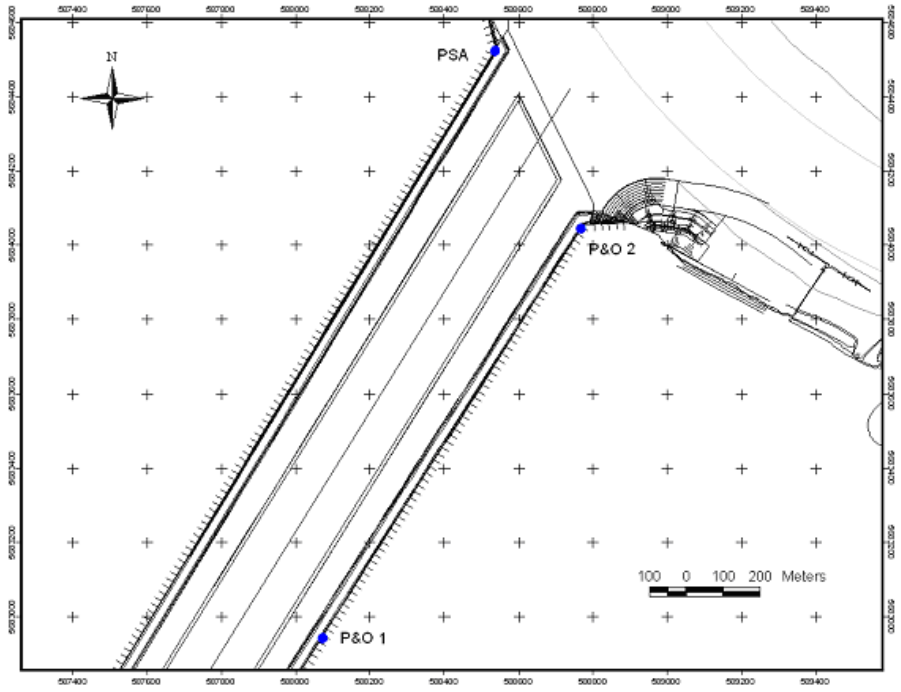
Overview of the measurement locations
21/03/2006 – 23/03/2006 & 26/09/2006 – 28/09/2006



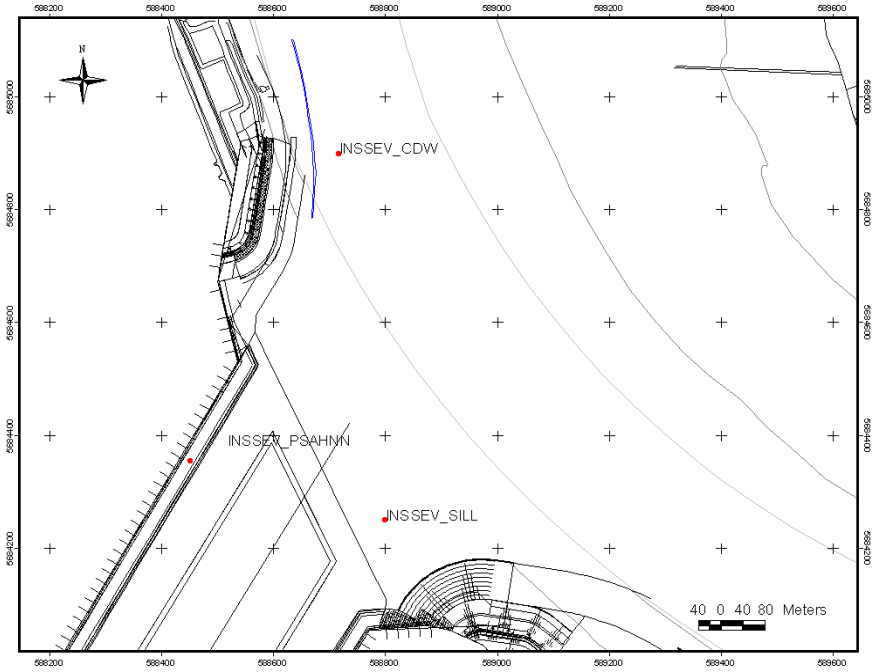
Overview of the measurement locations in Deurganckdok
21/03/2006 – 23/03/2006 & 26/09/2006 – 28/09/2006



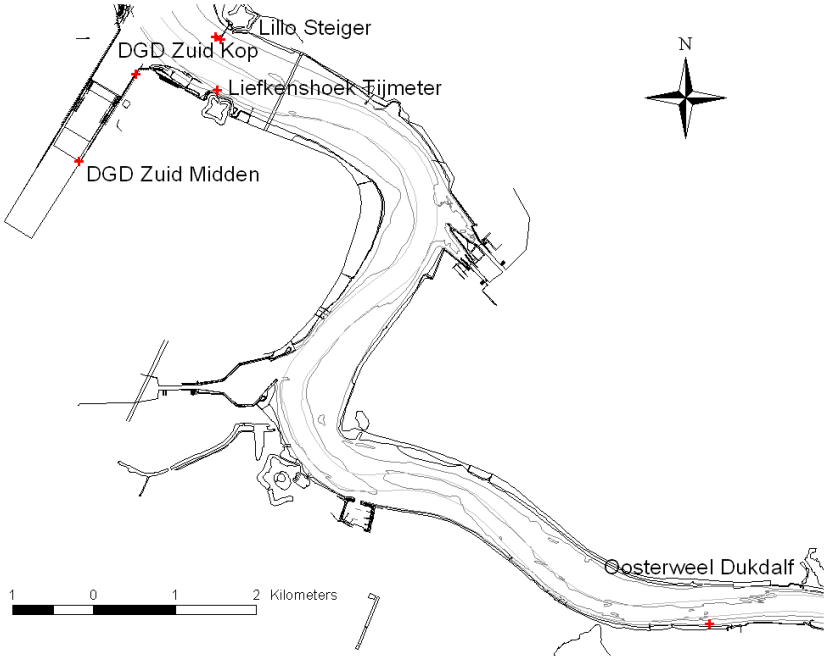
Near bed continuous monitoring
14/03/2006 – 05/04/2006 & 19/04/2006 – 23/05/2006 & 18/07/2006 – 11/10/2006 & 09/02/2007 – 18/04/2007



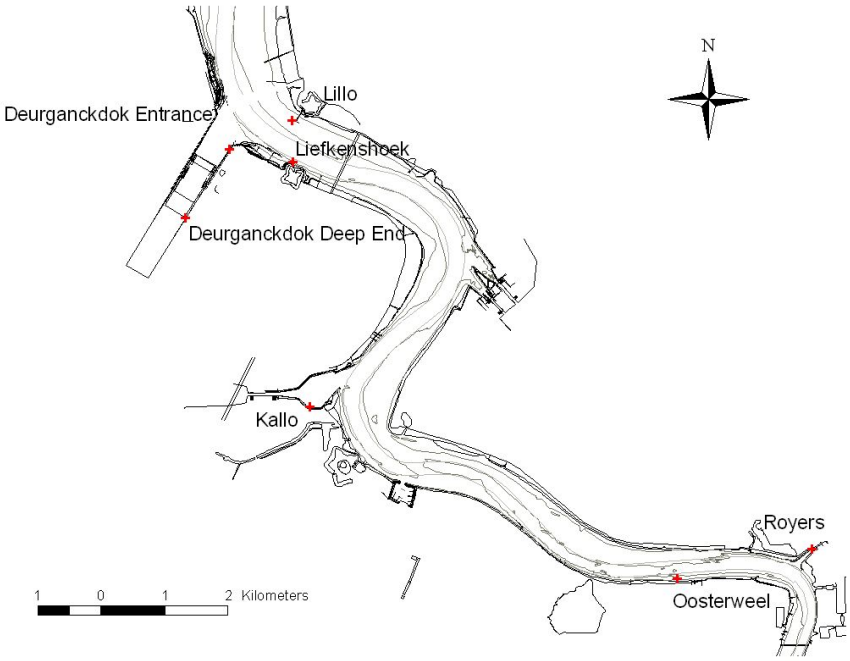
Long term salt-silt measurements in Deurganckdok
17/03/2006 – 28/04/2006 & 20/07/2006 – 12/10/2006 & 12/02/2007 – 27/03/2007



Settling velocity (INSSEV) 05/09/2006 – 07/09/2006



Calibration measurements - 15/03/2006 & 14/04/2006



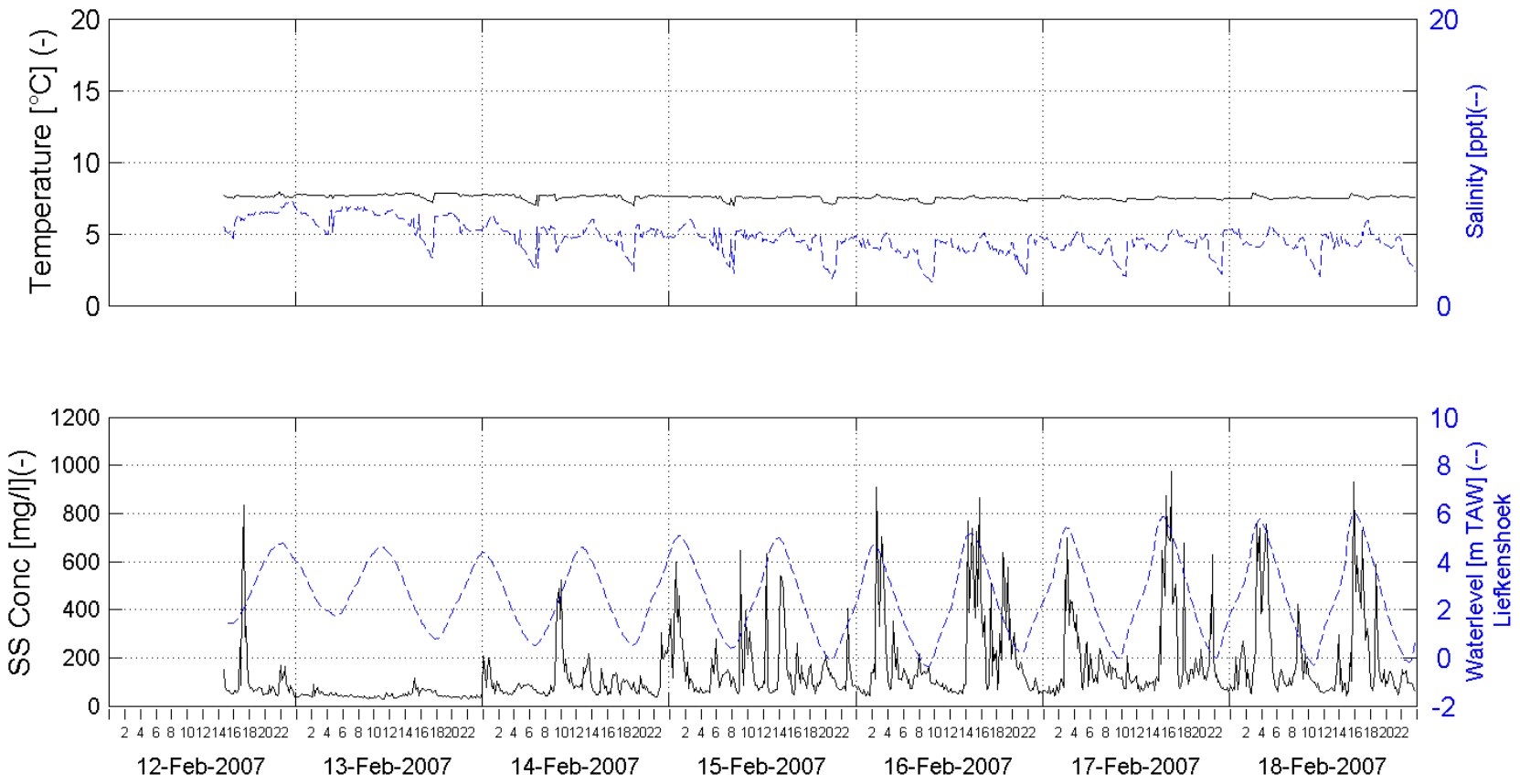
Calibration measurements - 23/06/2006 & 18/09/2006

APPENDIX B. WEEKSERIES ZOUT- SLIB METINGEN DGD

B.1 PSA (N-ENTRANCE)

11283 - Long-term monitoring DGD - Winter 2007

Week 7 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE BOTTOM 5.03m above bottom (-11.97m TAW)

Processed by:

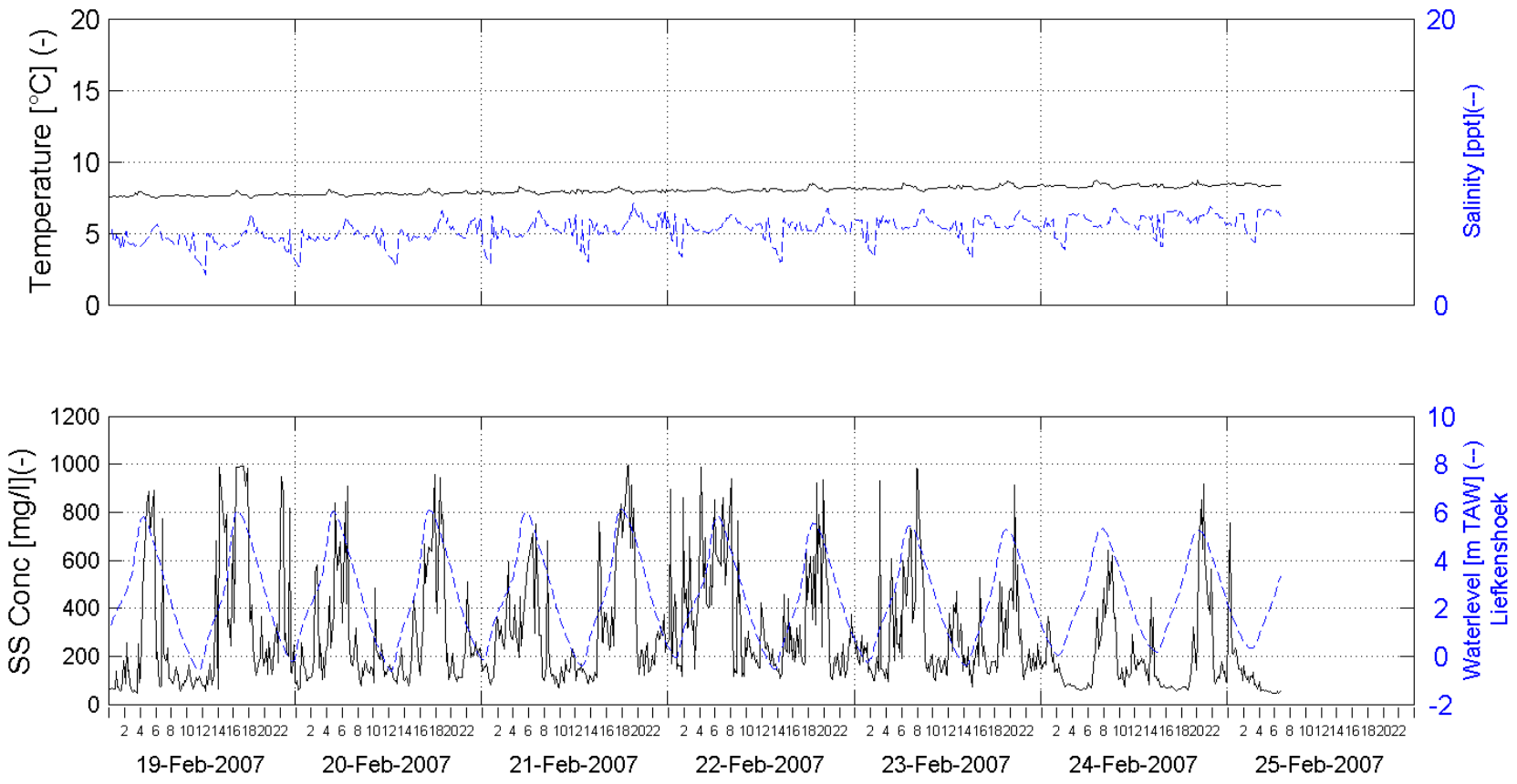
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 8 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE BOTTOM 5.03m above bottom (-11.97m TAW)

Processed by:

IMDC

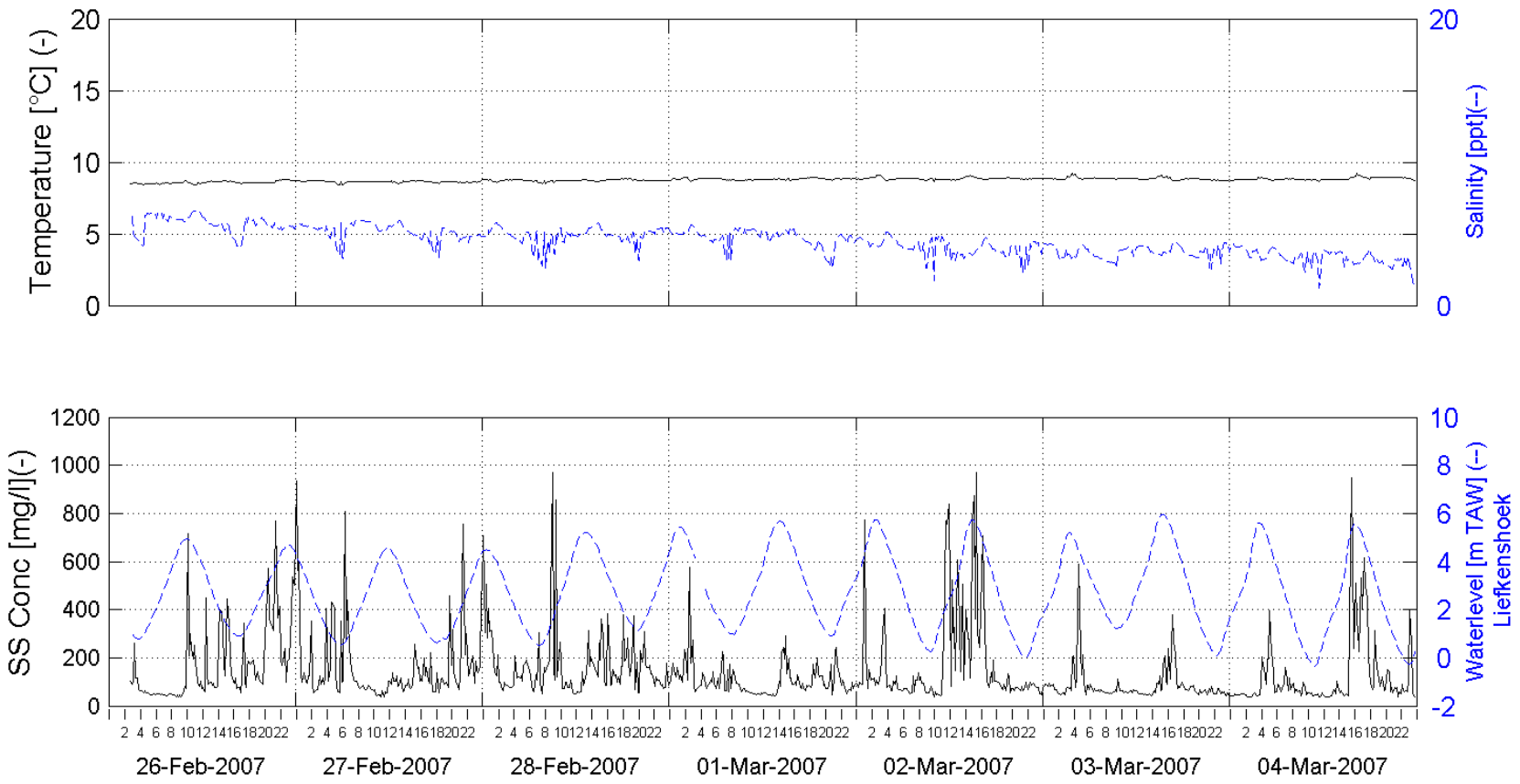
In Association with:

GEMS International

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 9 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE BOTTOM 5.03m above bottom (-11.97m TAW)

Processed by:

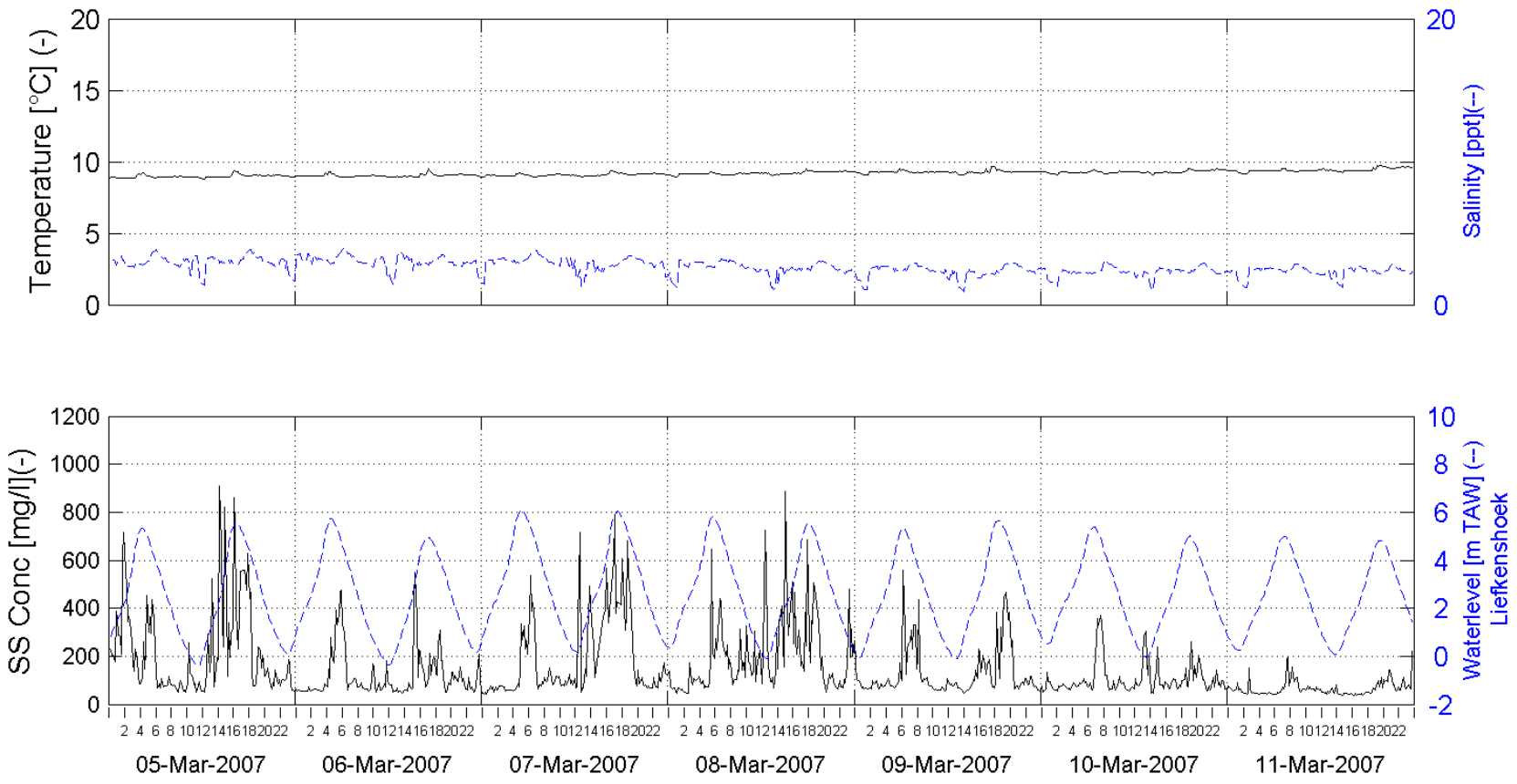
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 10 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE BOTTOM 5.03m above bottom (-11.97m TAW)

Processed by:

IMDC

In Association with:

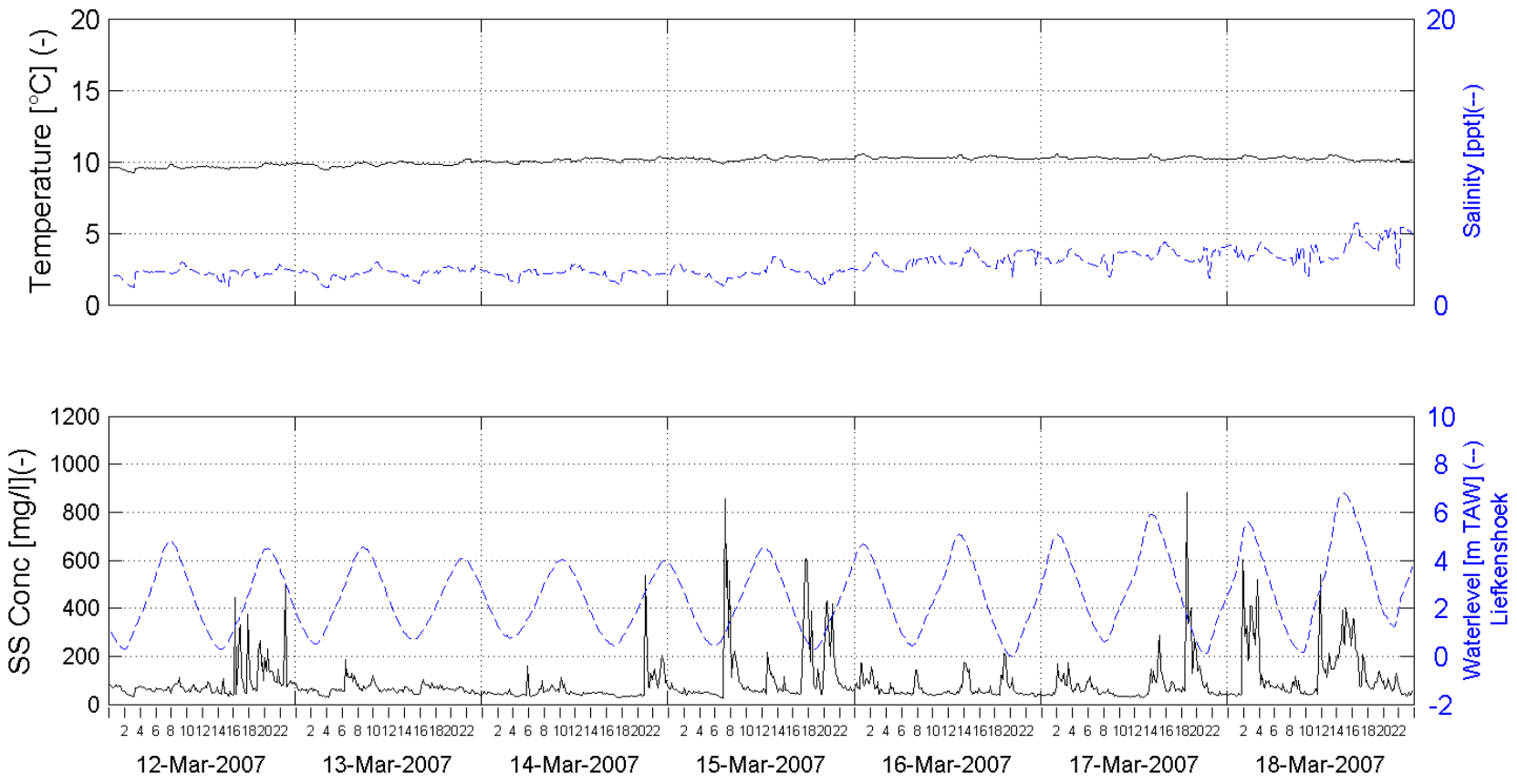
GEMS International

w.l | delft hydraulics

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 11 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE BOTTOM 5.03m above bottom (-11.97m TAW)

Processed by:

IMDC

In Association with:

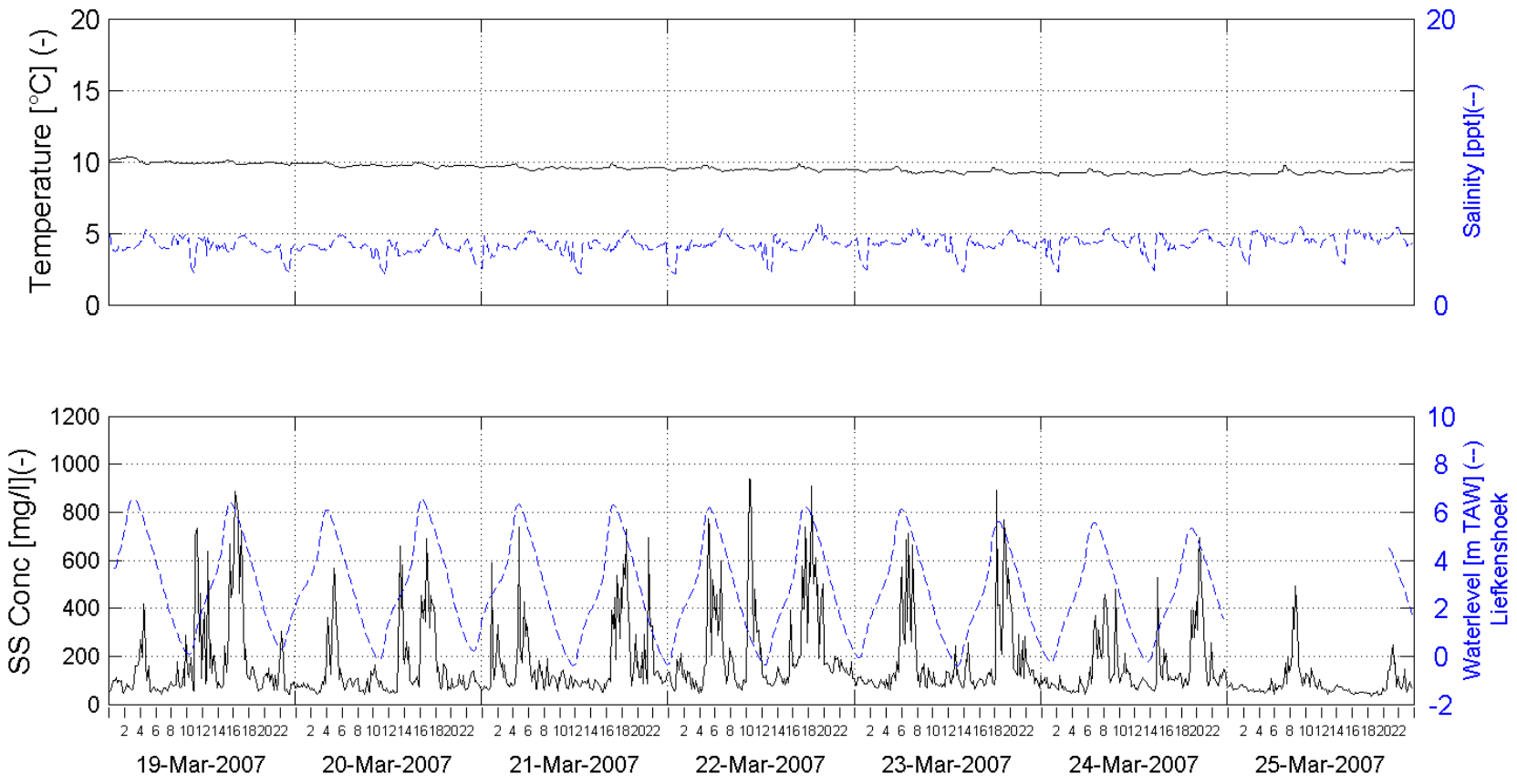
GEMS International

w.l | delft hydraulics

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 12 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE BOTTOM 5.03m above bottom (-11.97m TAW)

Processed by:

IMDC

In Association with:

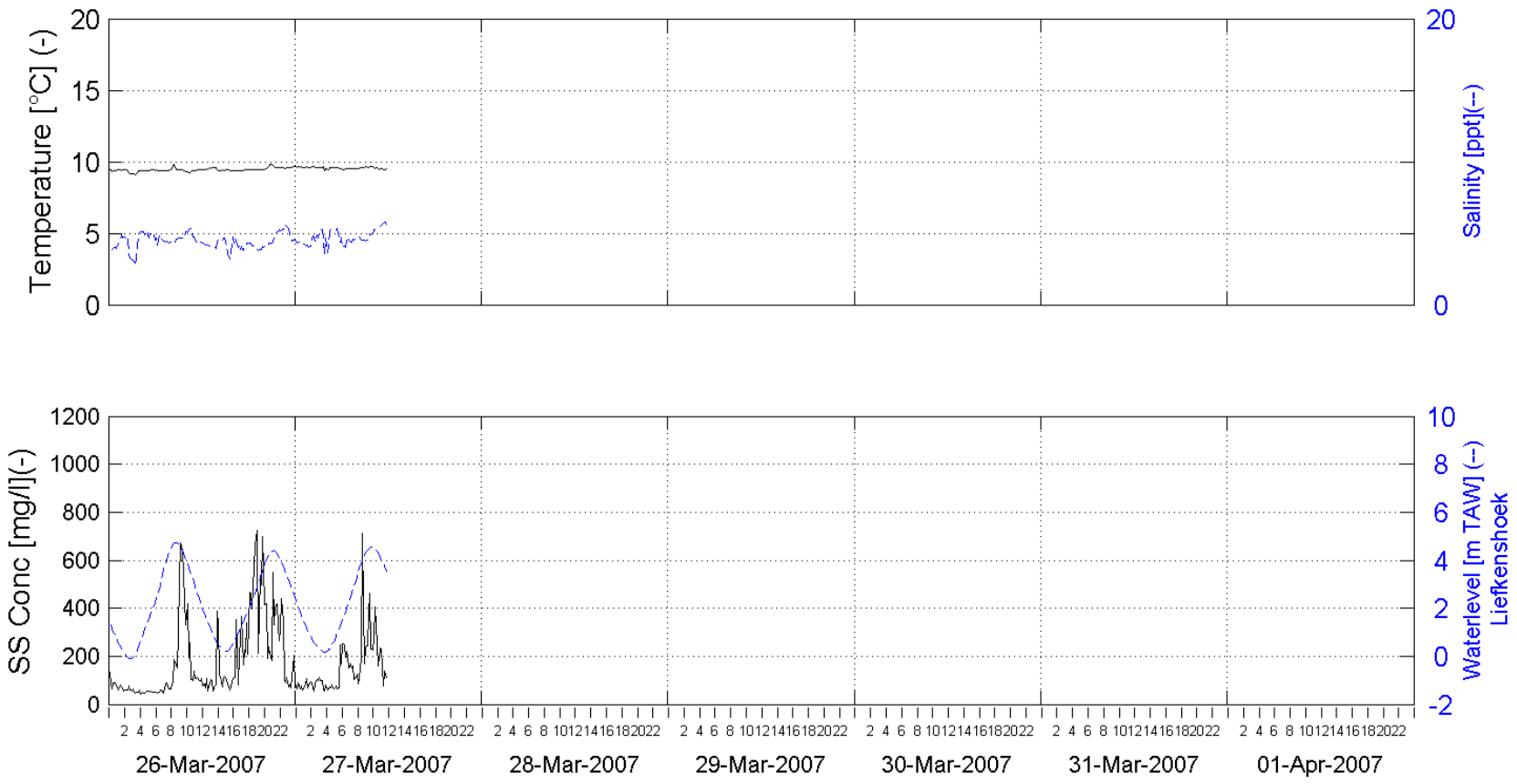
GEMS International

w.l | delft hydraulics

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 13 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE BOTTOM 5.03m above bottom (-11.97m TAW)

Processed by:

IMDC

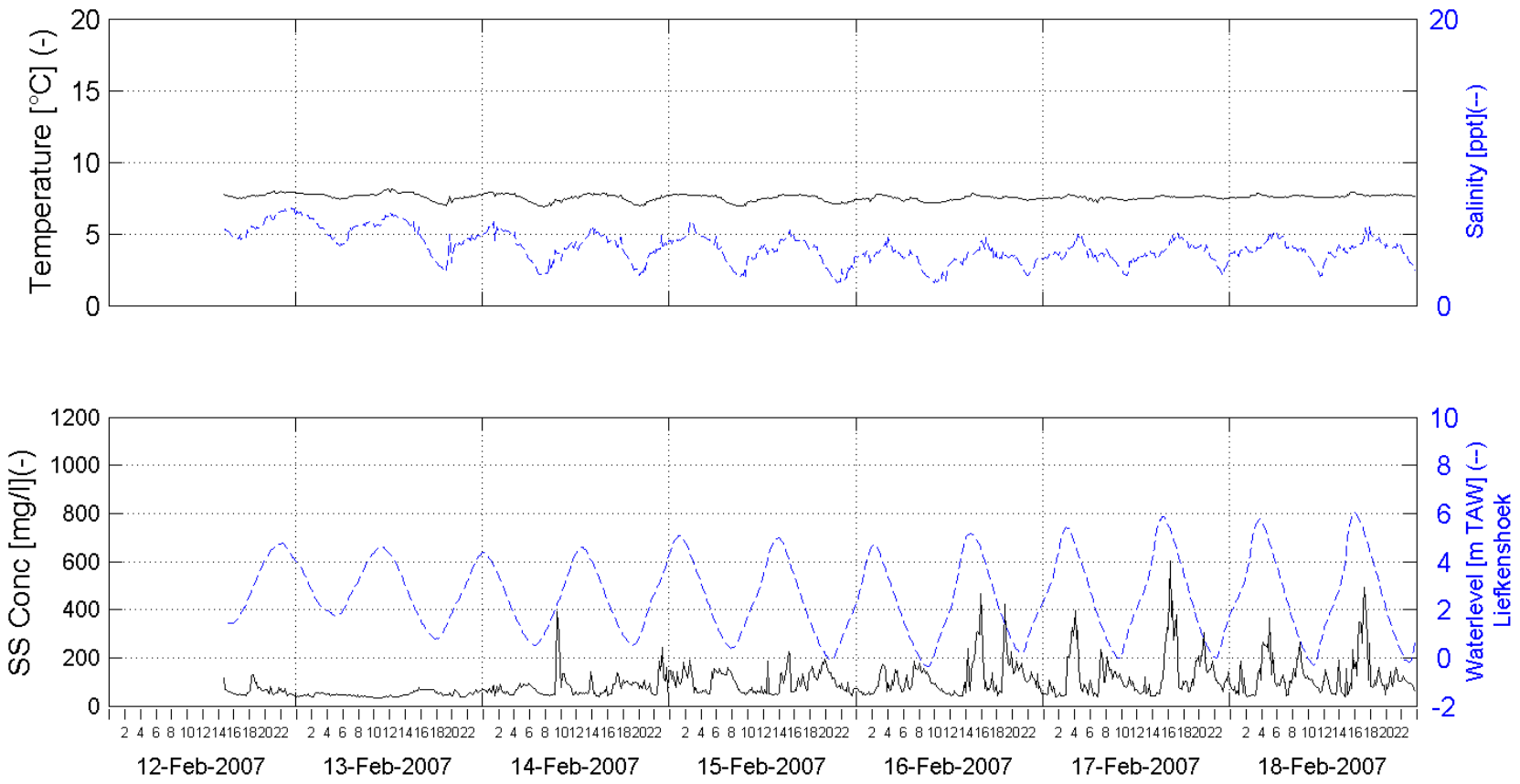
In Association with:

GEMS International

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 7 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE TOP 14.73m above bottom (-2.27m TAW)

Processed by:

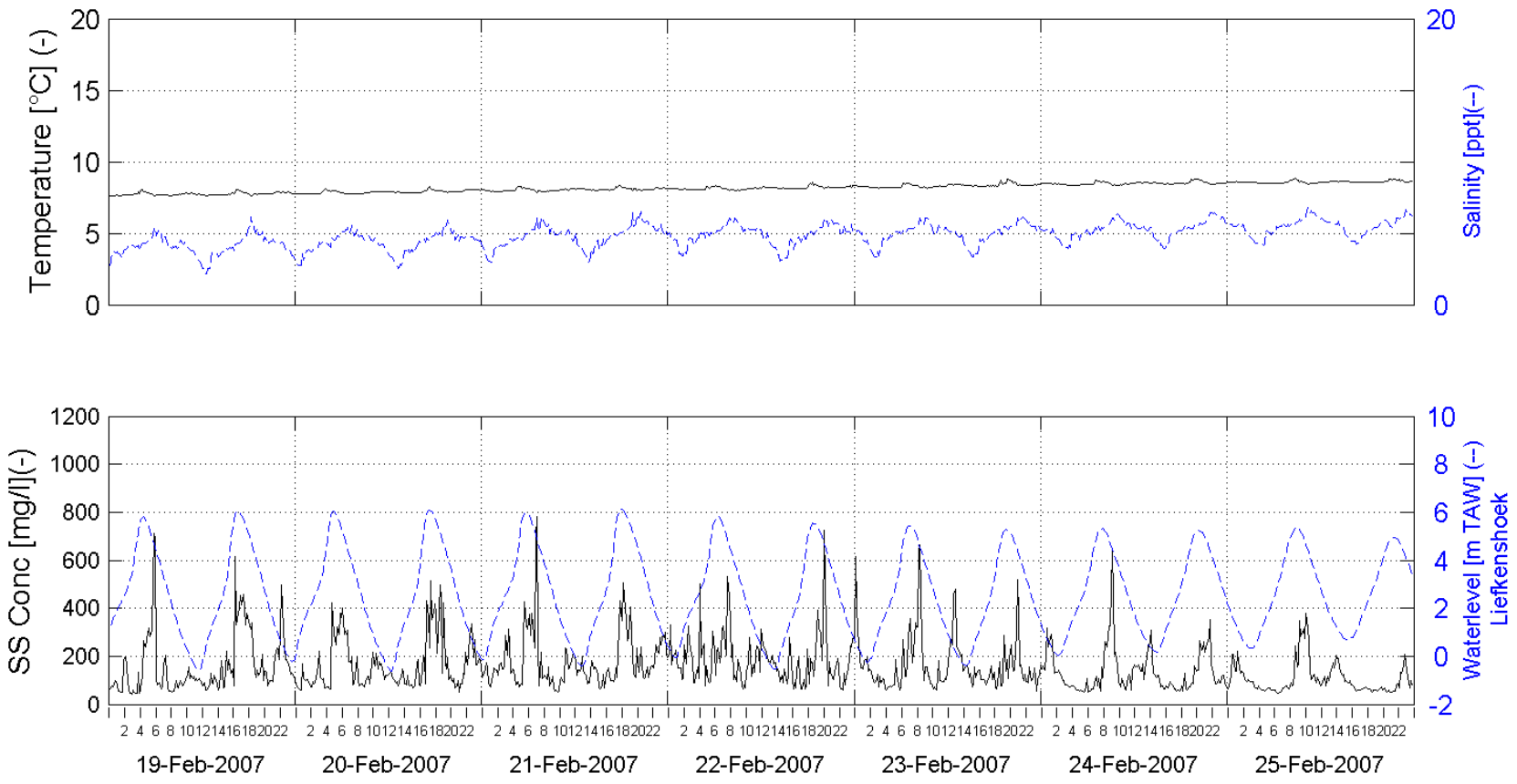
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 8 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE TOP 14.73m above bottom (-2.27m TAW)

Processed by:

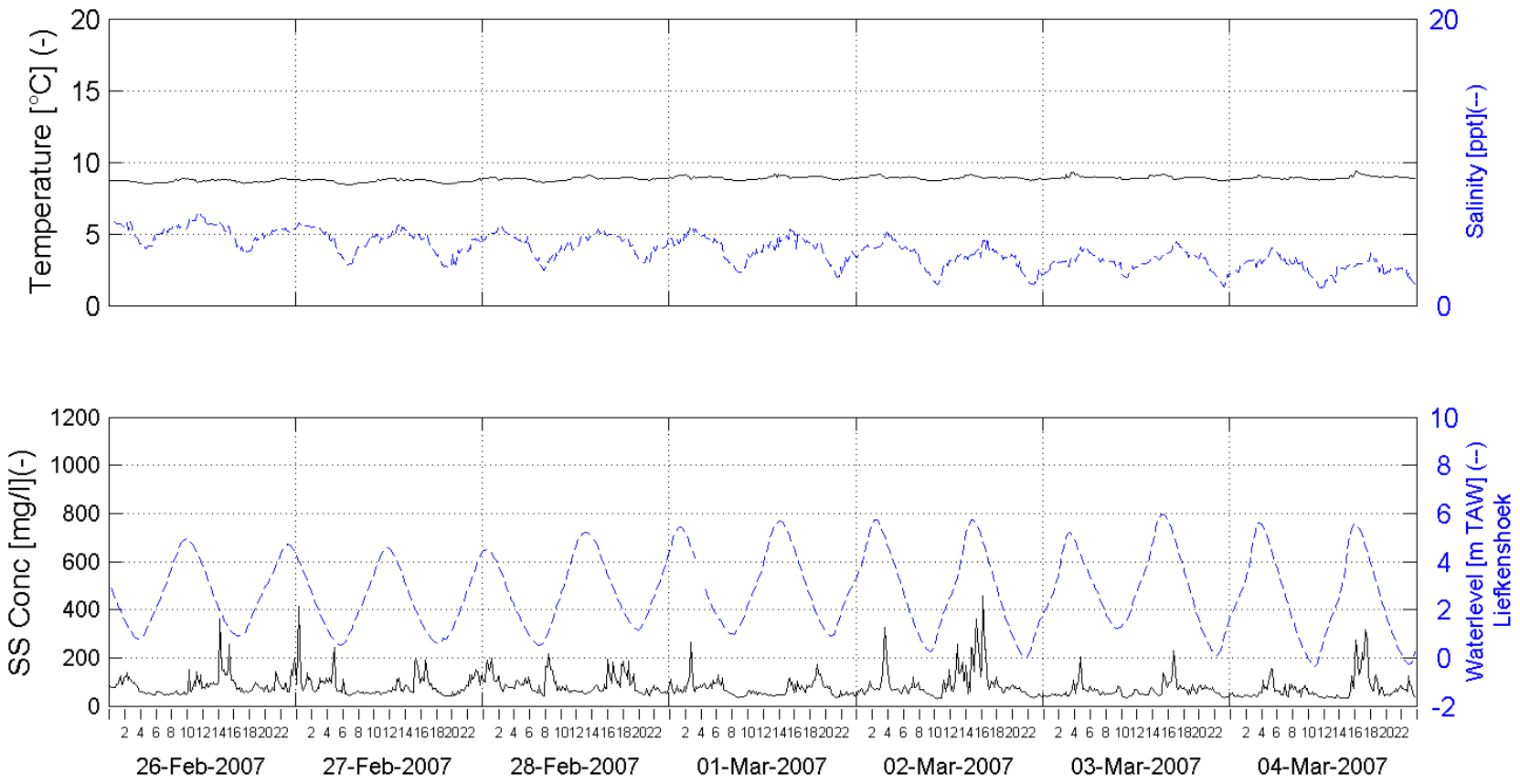
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 9 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE TOP 14.73m above bottom (-2.27m TAW)

Processed by:

IMDC

In Association with:

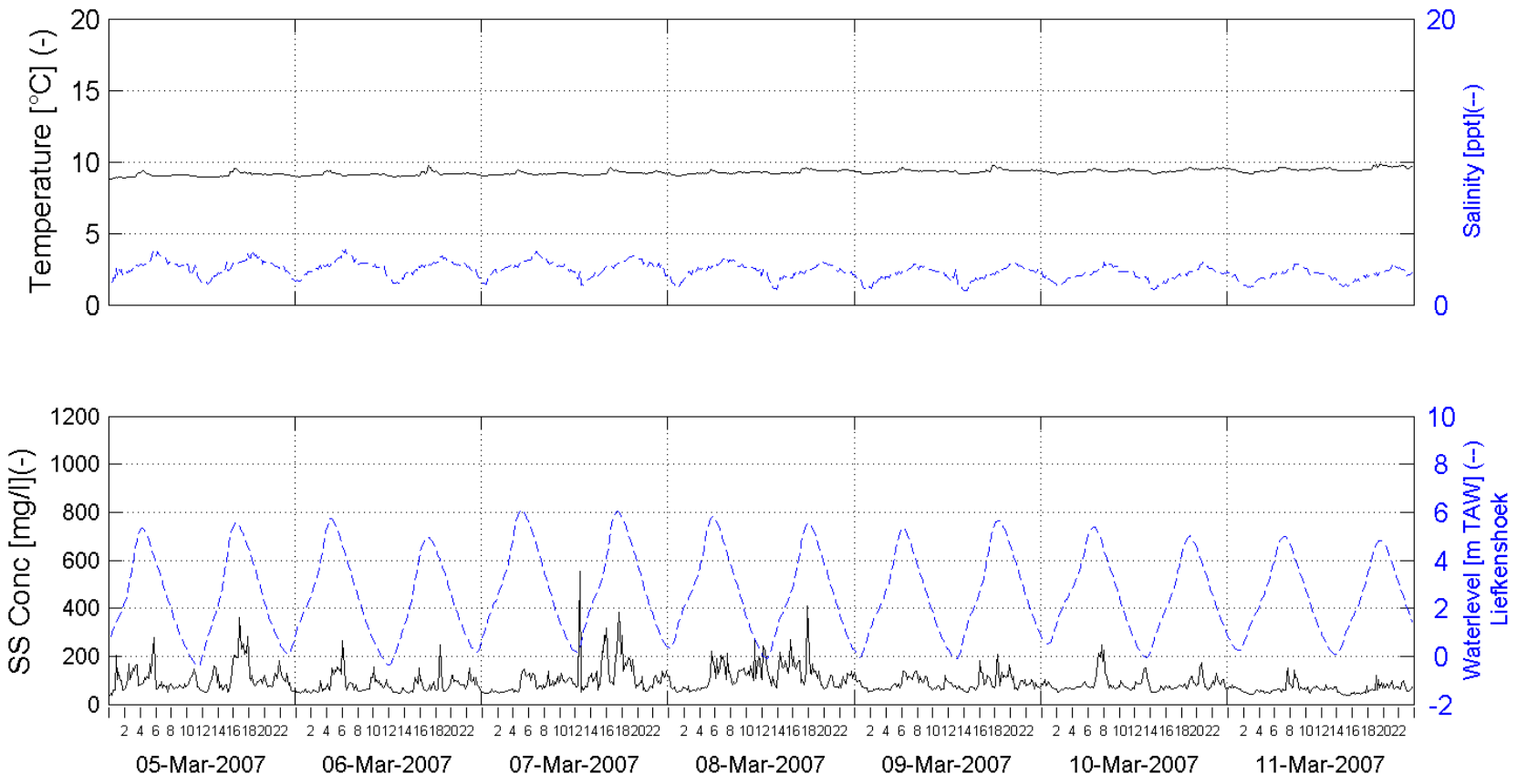
GEMS International

wl | delft hydraulics

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 10 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE TOP 14.73m above bottom (-2.27m TAW)

Processed by:

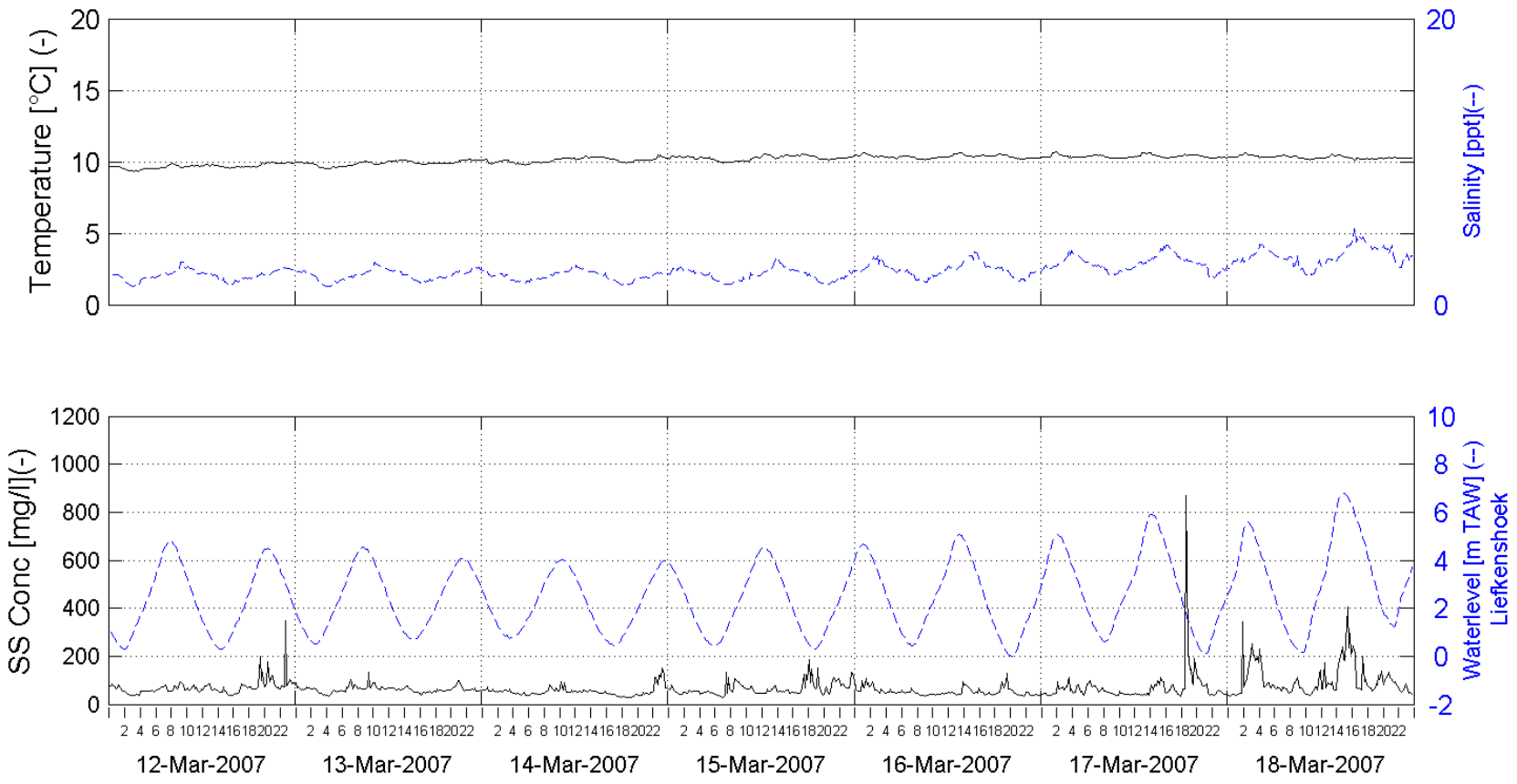
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 11 - 2007



Week series of Salinity, Temperature,
SS Concentration and Tide

Location:

N-ENTRANCE TOP 14.73m above bottom (-2.27m TAW)

Processed by:

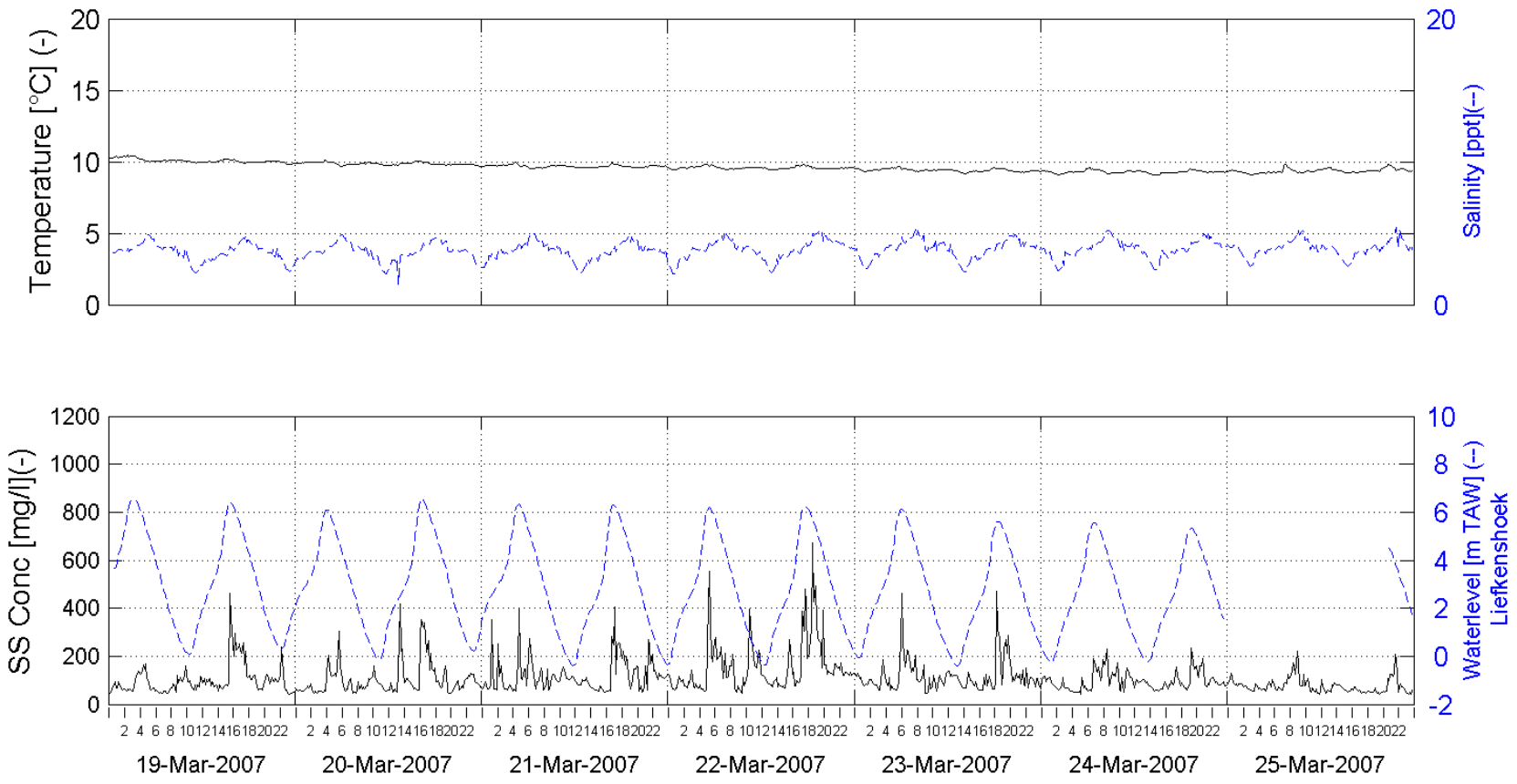
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 12 - 2007



Week series of Salinity, Temperature,
SS Concentration and Tide

Location:

N-ENTRANCE TOP 14.73m above bottom (-2.27m TAW)

Processed by:

IMDC

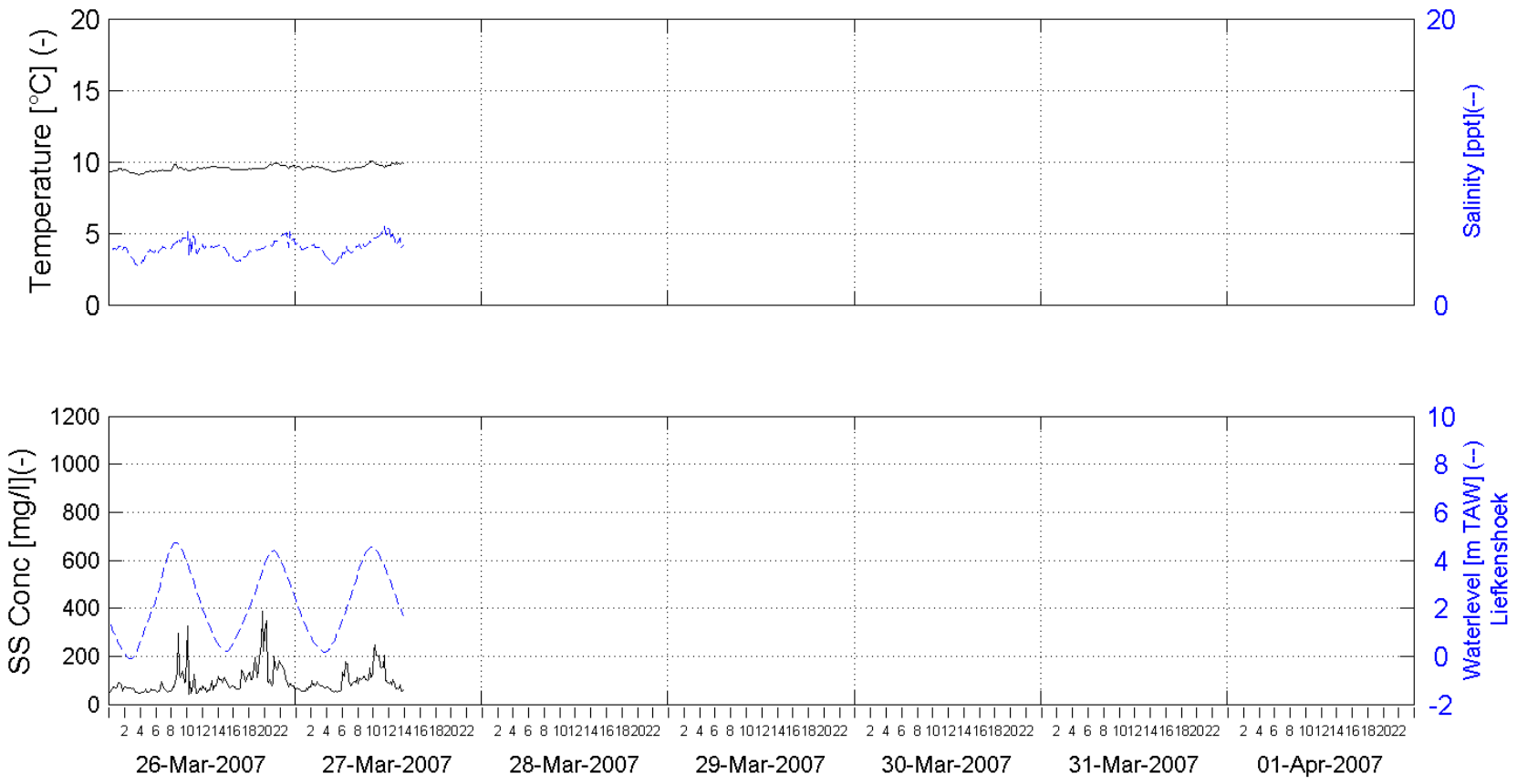
In Association with:

GEMS International

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 13 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

N-ENTRANCE TOP 14.73m above bottom (-2.27m TAW)

Processed by:

IMDC

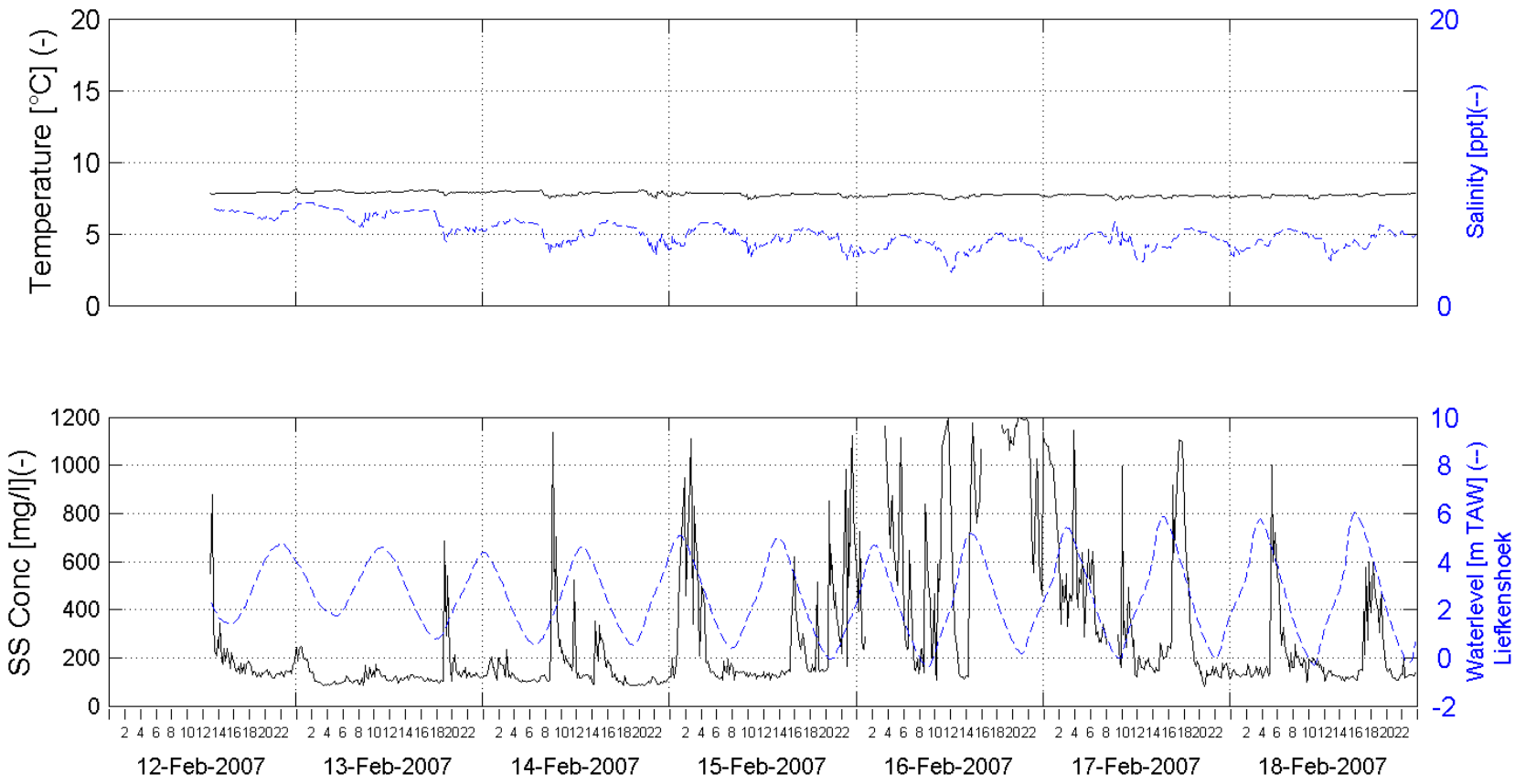
In Association with:

I/RA/11283/06.123/MSA

B.2 P&O1 (S-BACK)

11283 - Long-term monitoring DGD - Winter 2007

Week 7 - 2007



Week series of Salinity, Temperature,
SS Concentration and Tide

Location:

S-BACK BOTTOM 4.89m above bottom (-12.11m TAW)

Processed by:

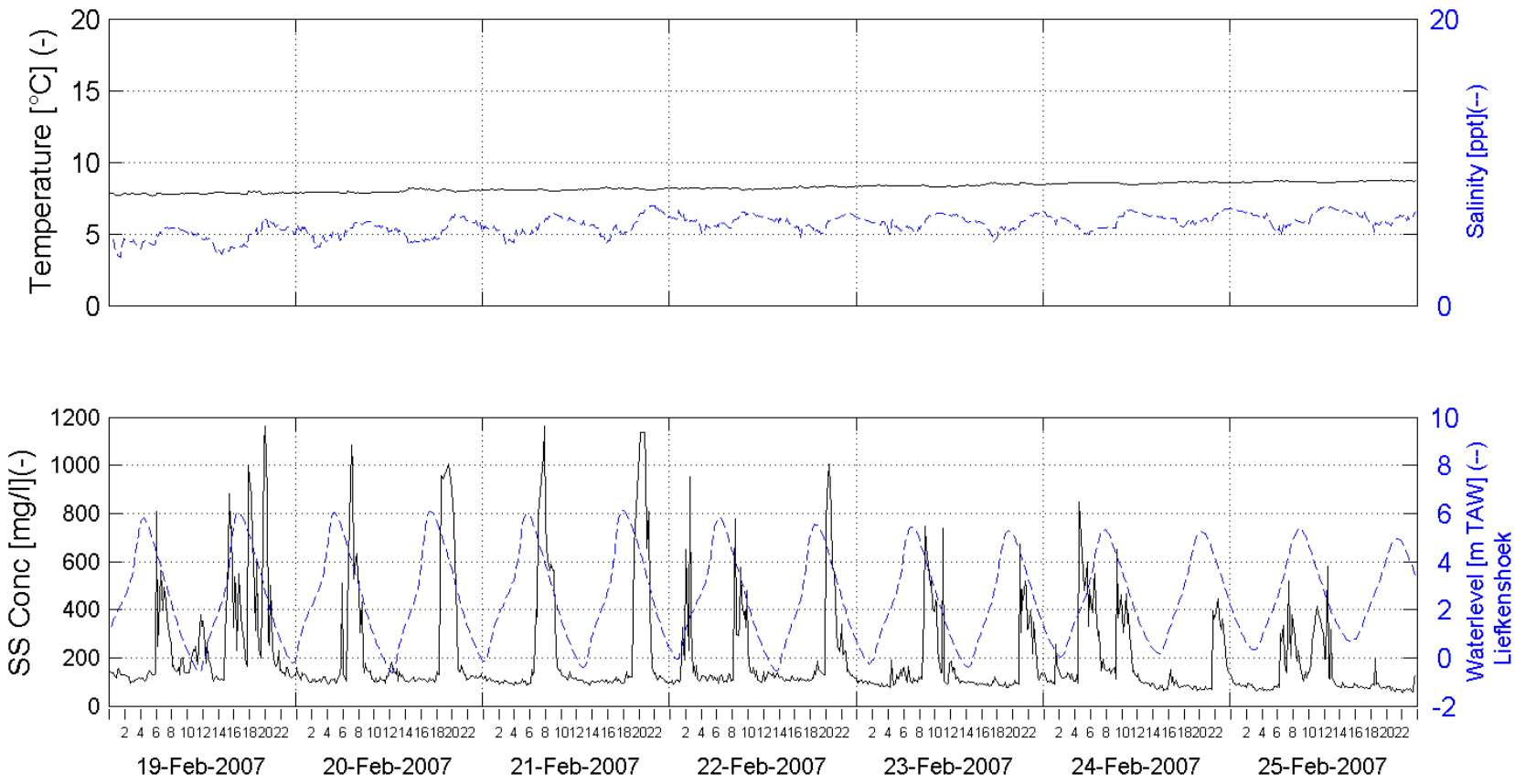
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 8 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-BACK BOTTOM 4.89m above bottom (-12.11m TAW)

Processed by:

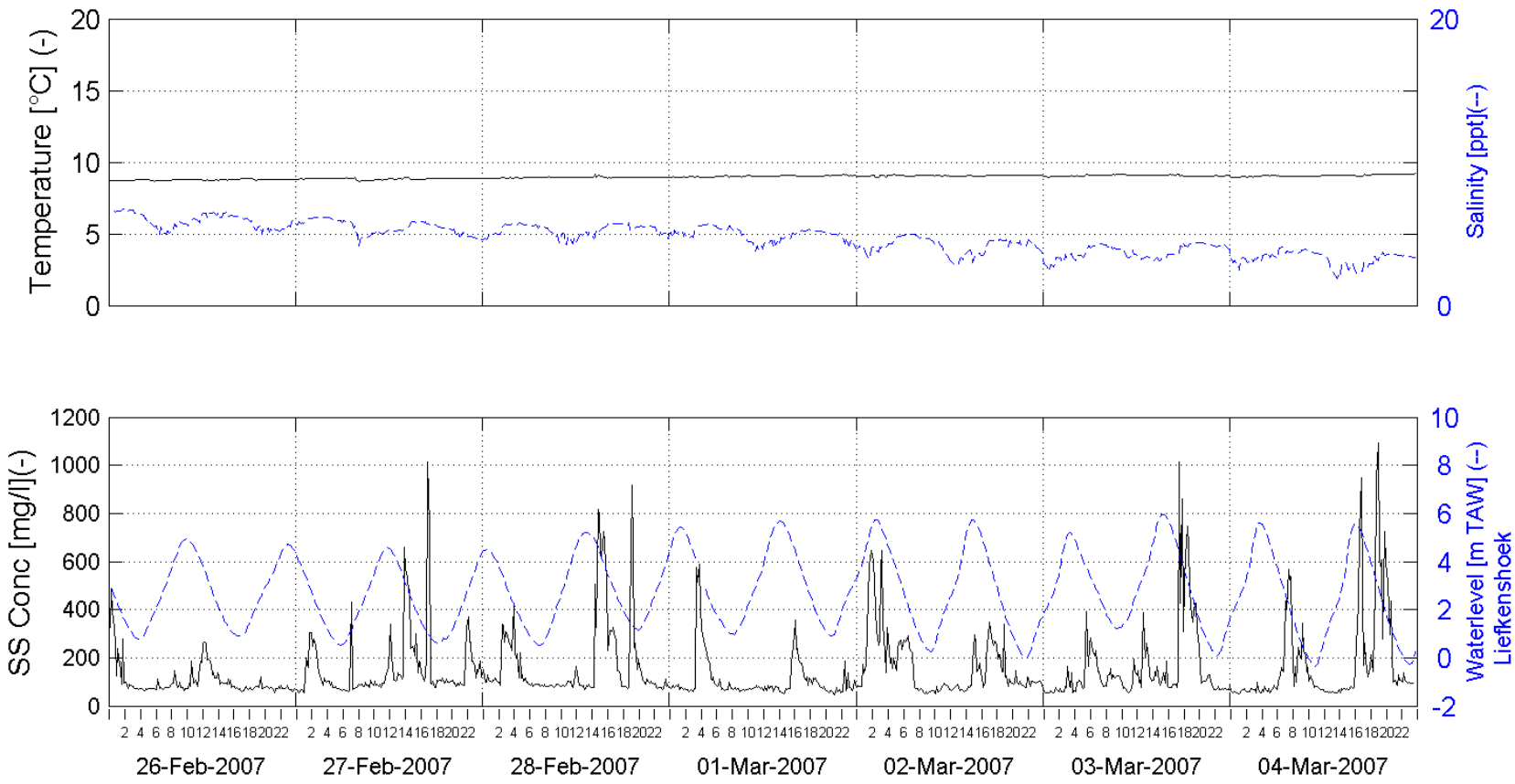
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 9 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-BACK BOTTOM 4.89m above bottom (-12.11m TAW)

Processed by:

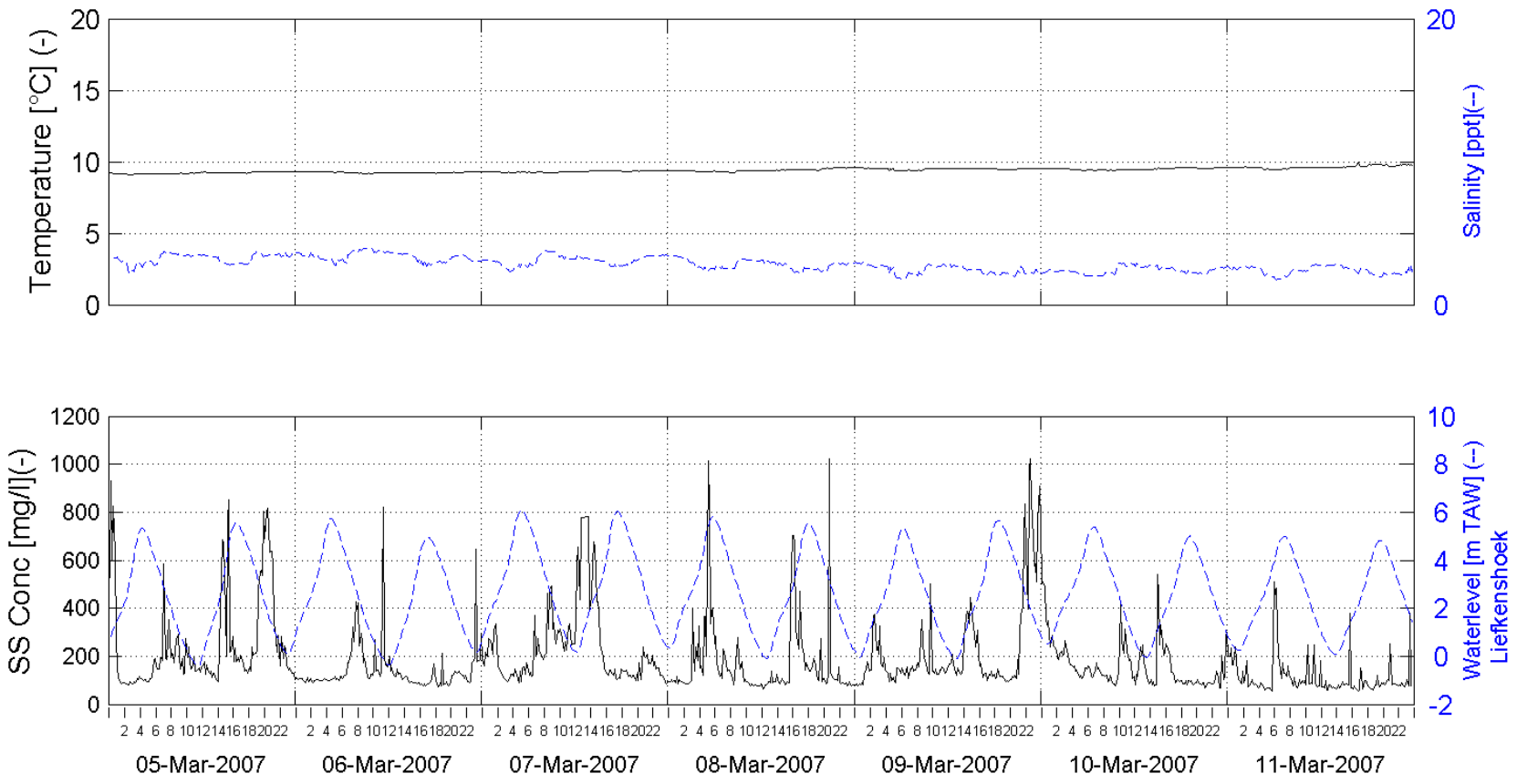
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 10 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-BACK BOTTOM 4.89m above bottom (-12.11m TAW)

Processed by:

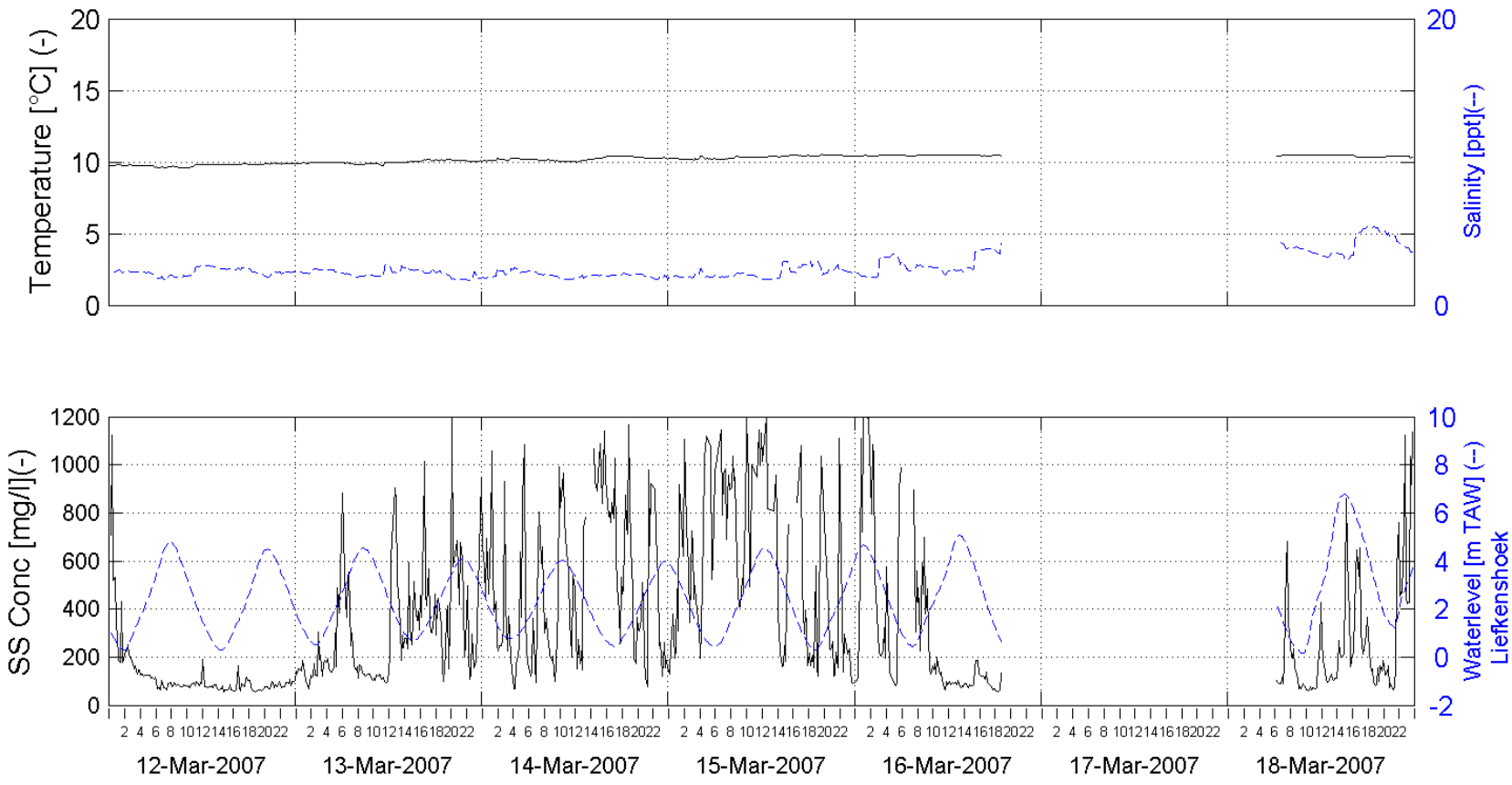
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 11 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-BACK BOTTOM 4.89m above bottom (-12.11m TAW)

Processed by:

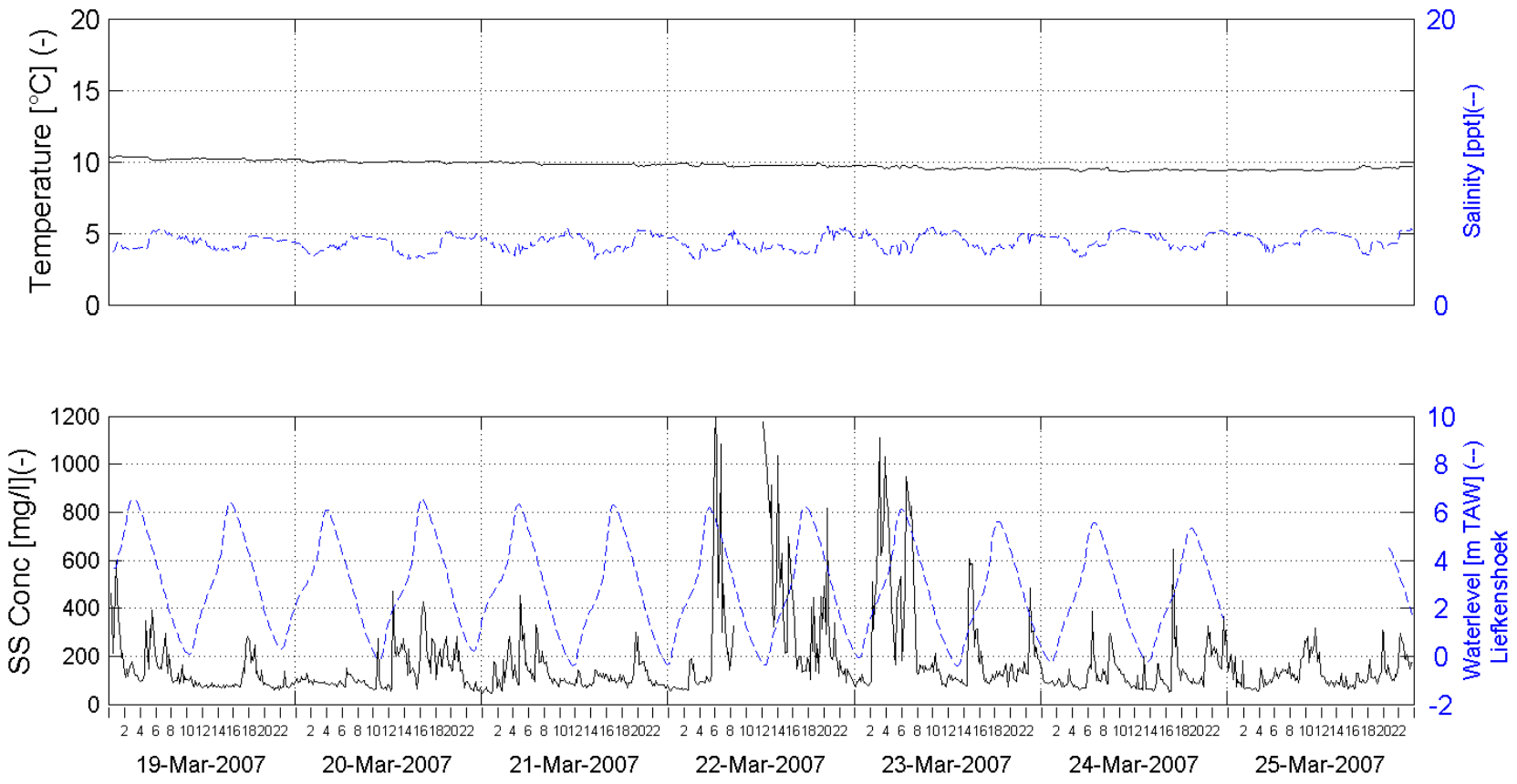
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 12 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

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Processed by:

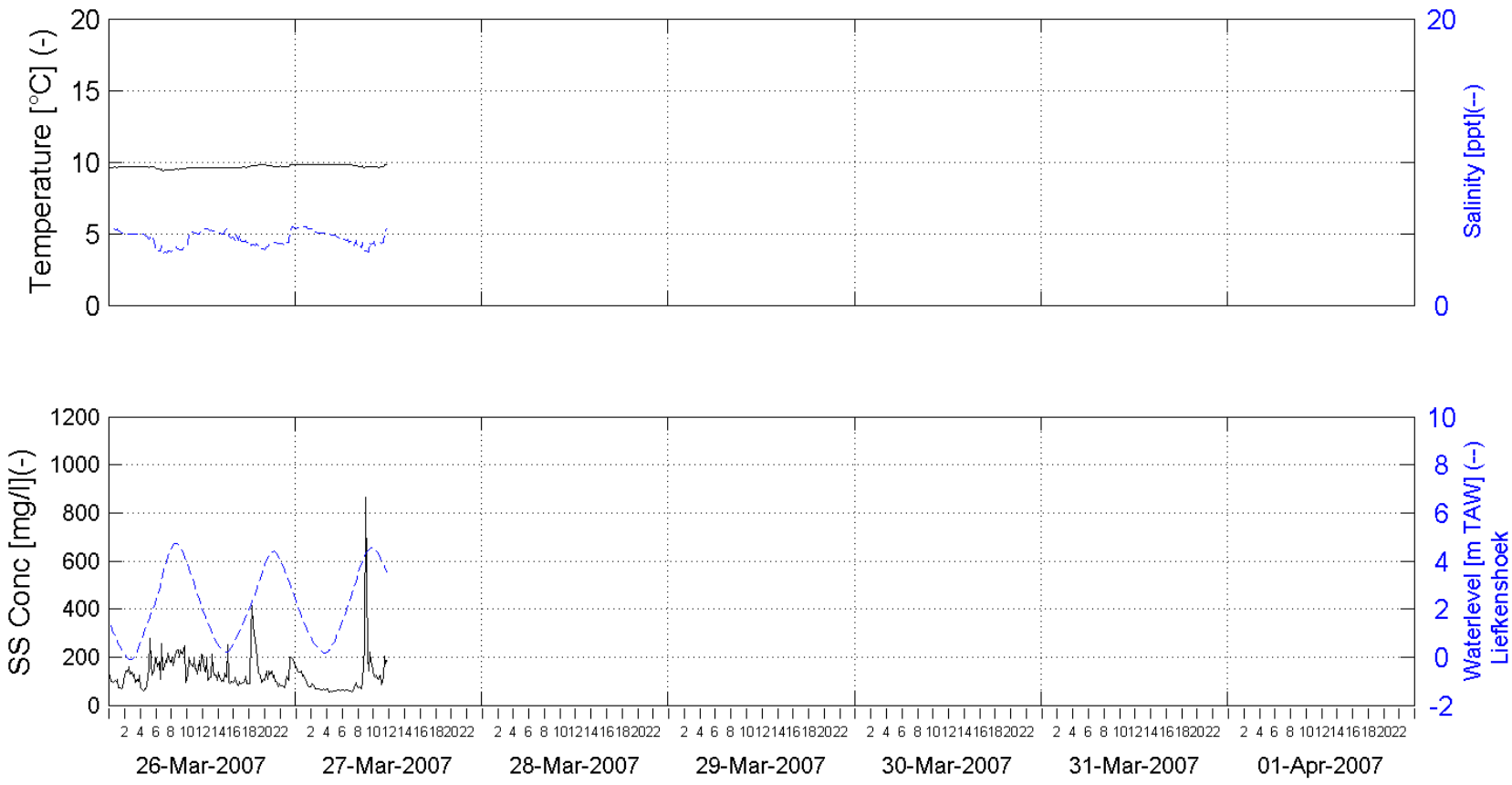
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 13 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

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Processed by:

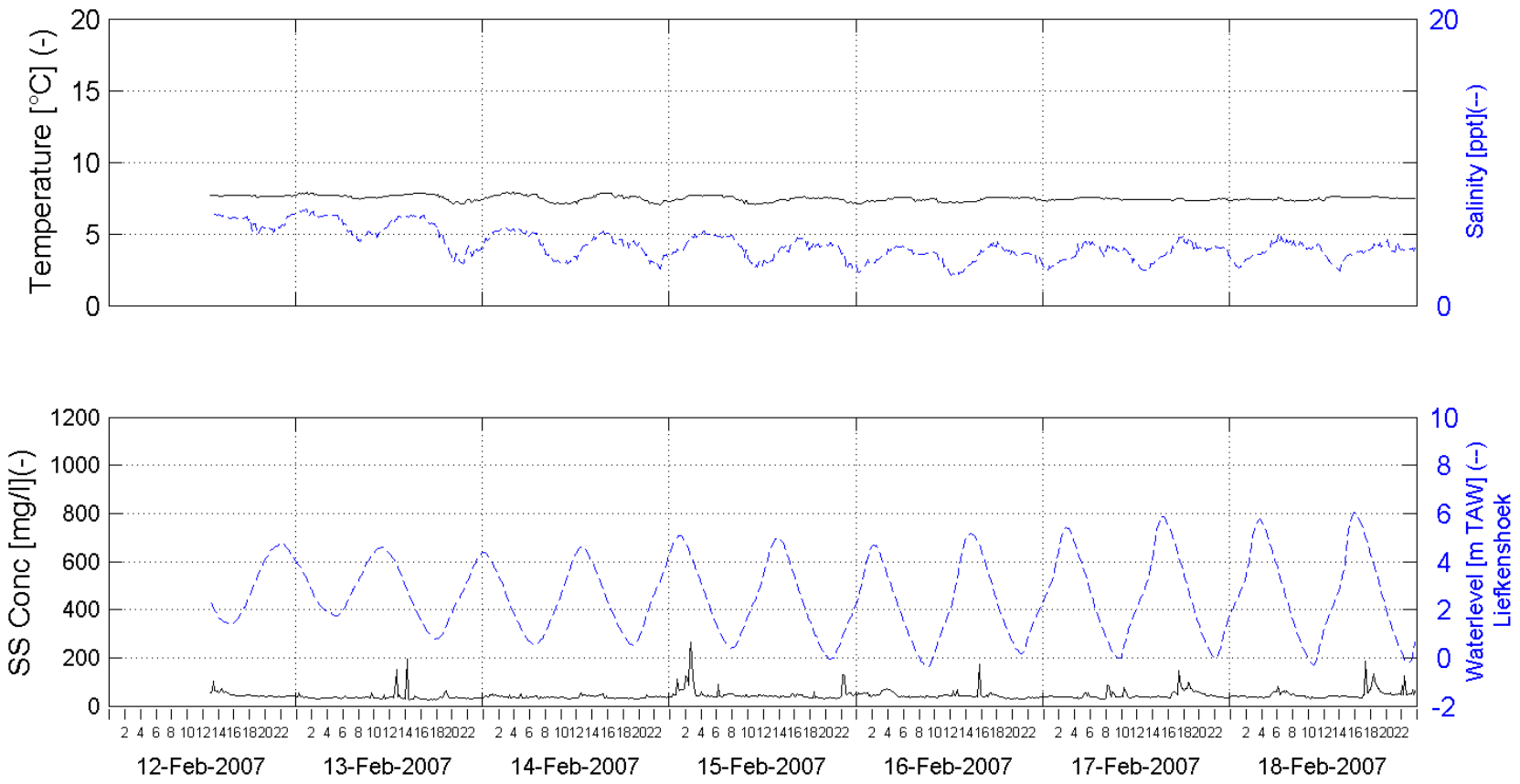
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 7 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-BACK TOP 14.37m above bottom (-2.63m TAW)

Processed by:

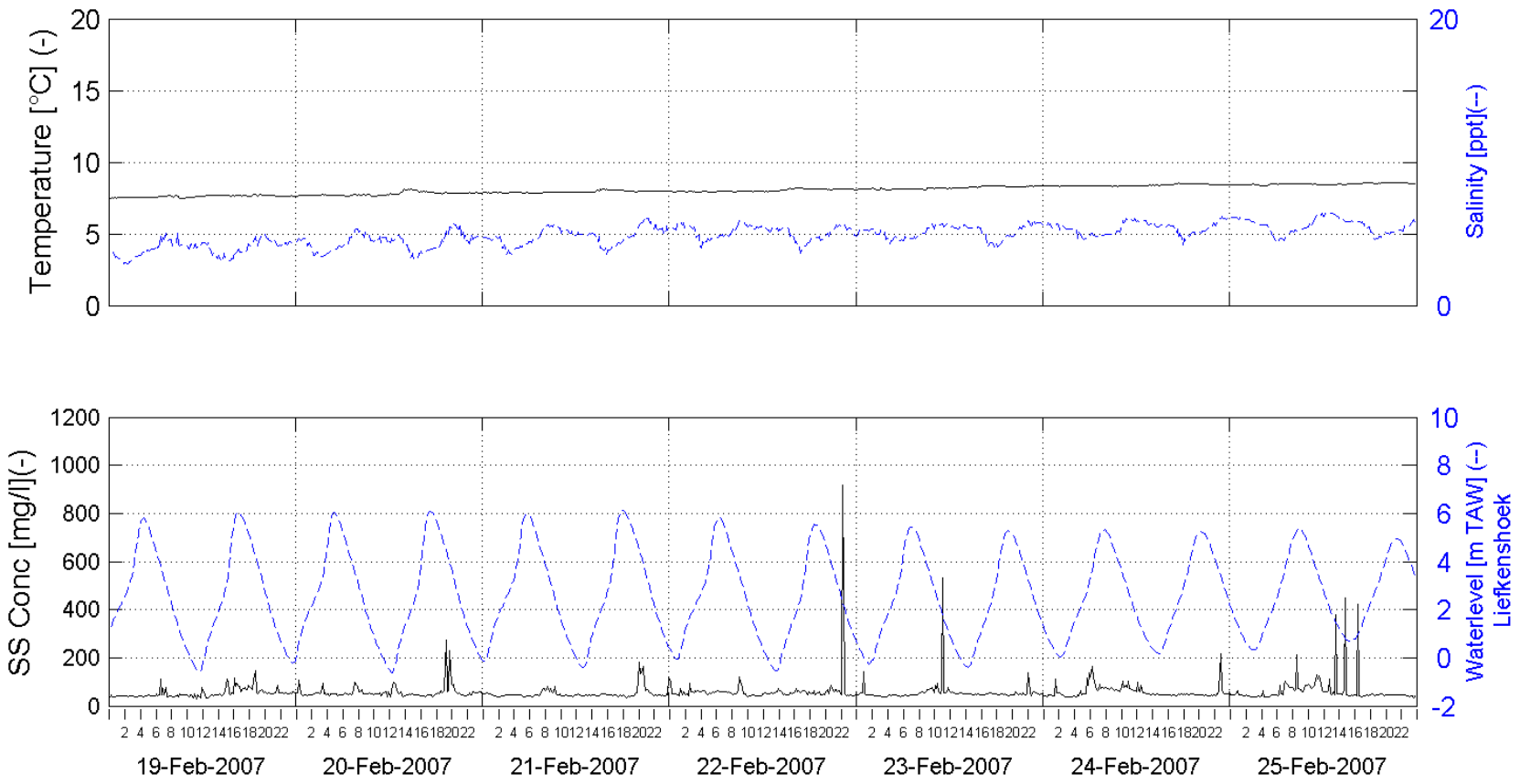
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 8 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-BACK TOP 14.37m above bottom (-2.63m TAW)

Processed by:

IMDC

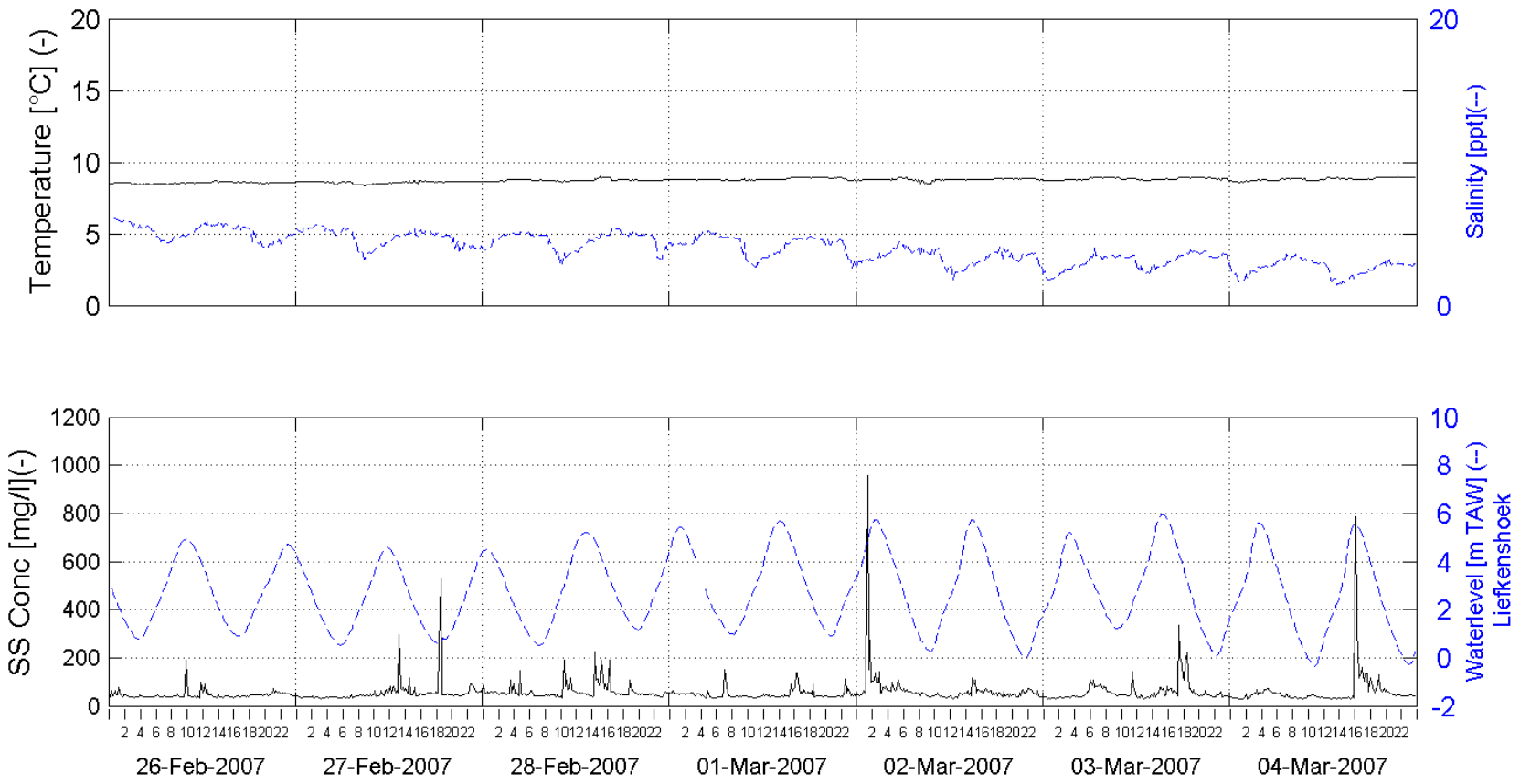
In Association with:

GEMS International

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 9 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-BACK TOP 14.37m above bottom (-2.63m TAW)

Processed by:

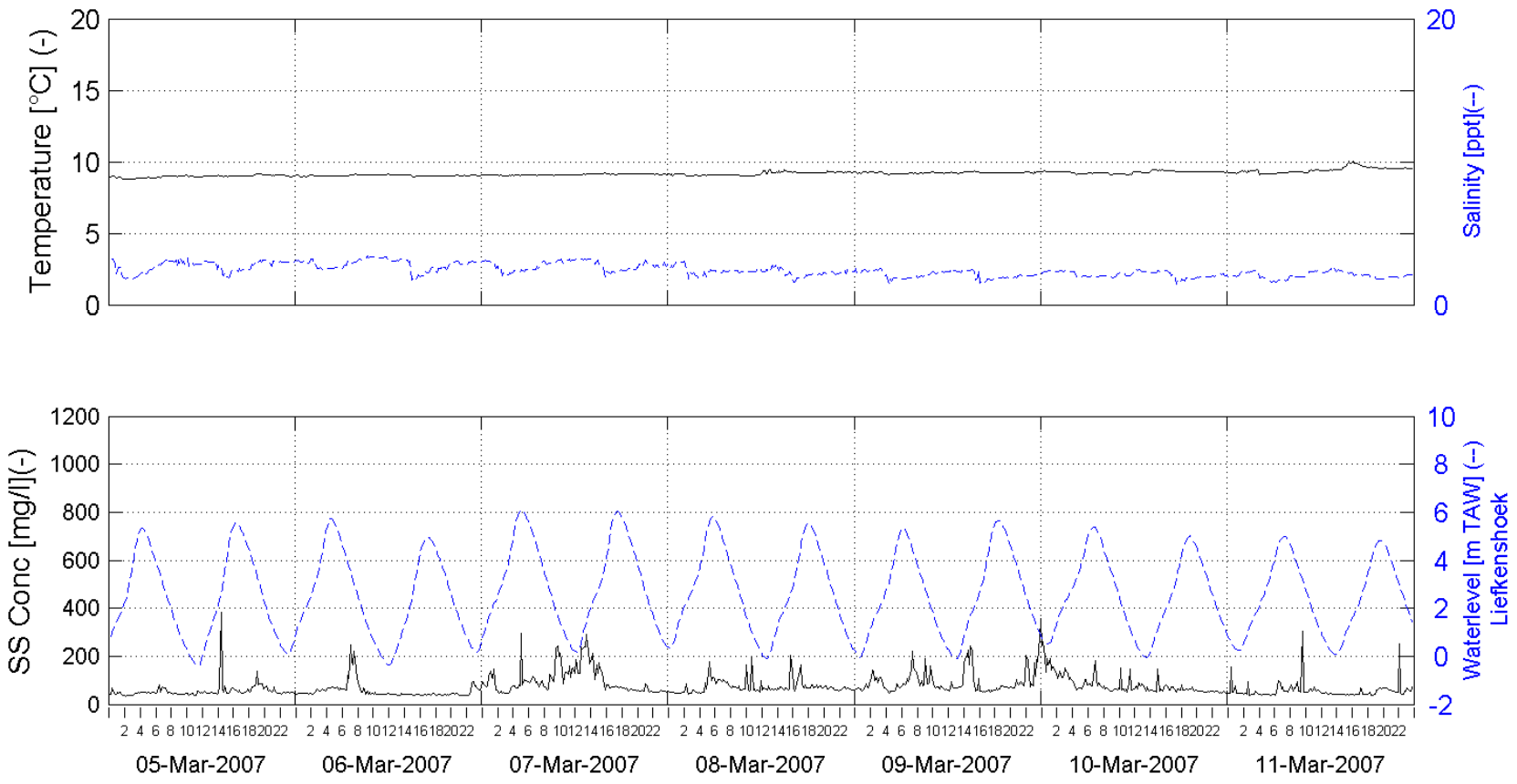
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 10 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-BACK TOP 14.37m above bottom (-2.63m TAW)

Processed by:

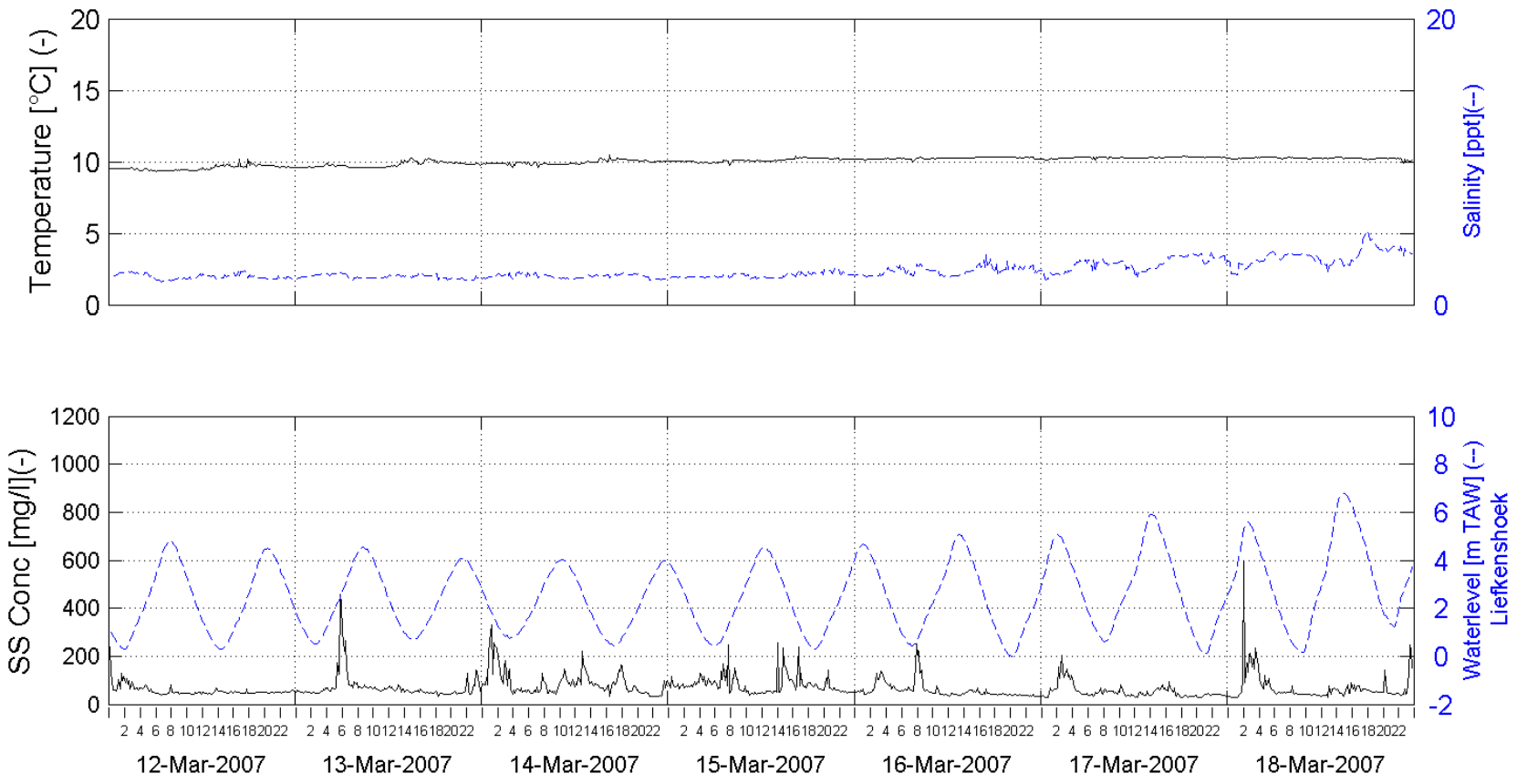
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 11 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-BACK TOP 14.37m above bottom (-2.63m TAW)

Processed by:

IMDC

In Association with:

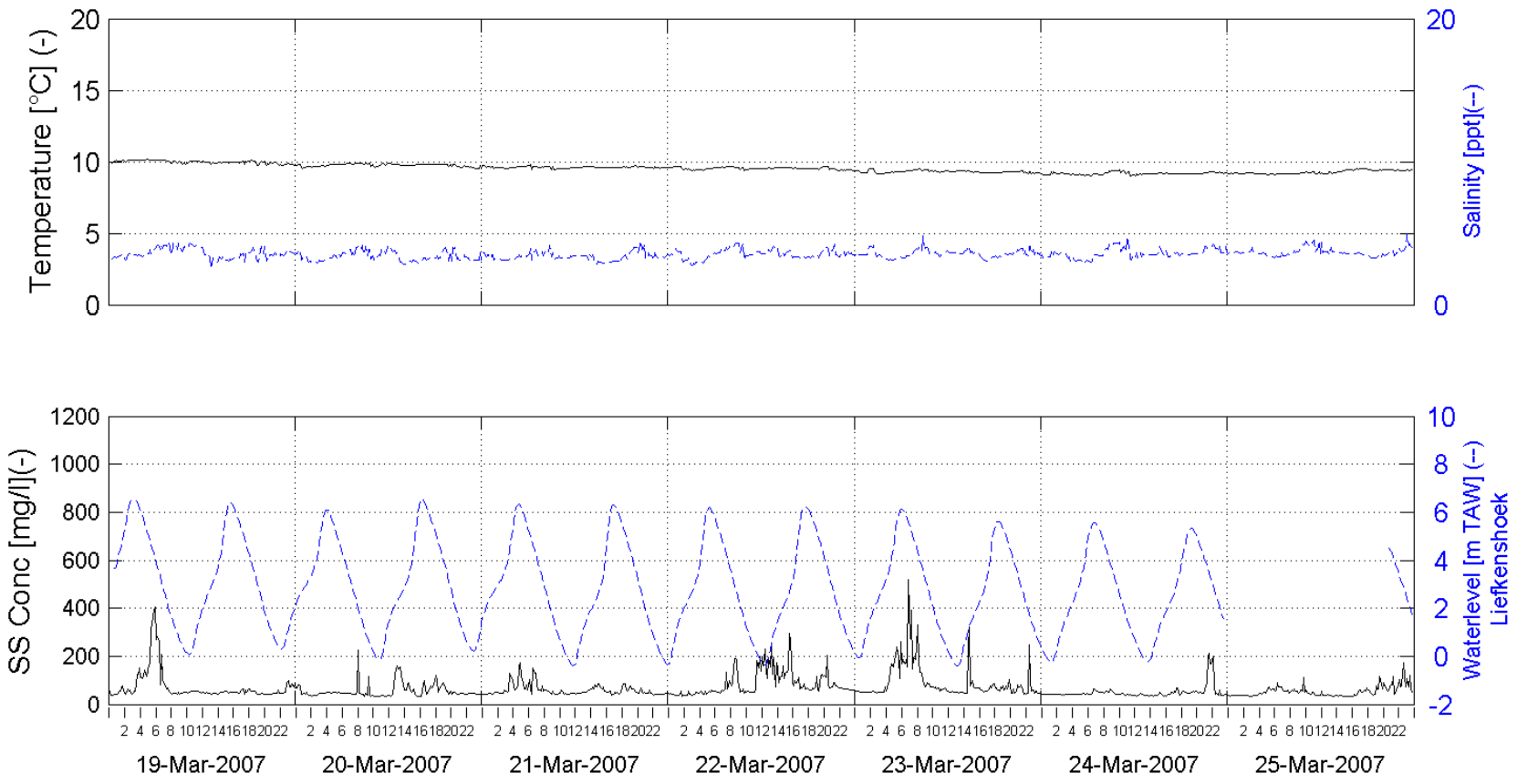
GEMS International

wl | delft hydraulics

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 12 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-BACK TOP 14.37m above bottom (-2.63m TAW)

Processed by:

IMDC

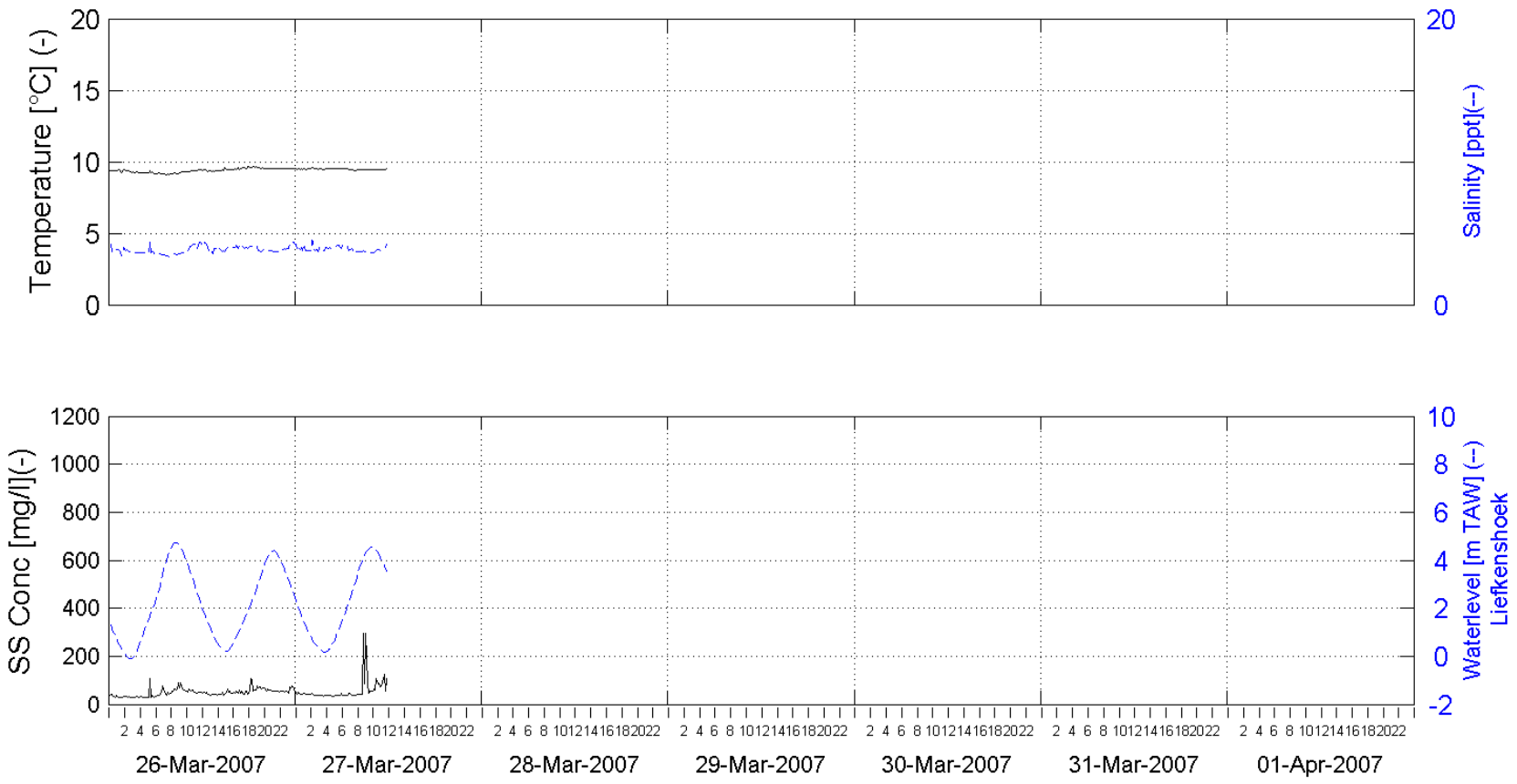
In Association with:

GEMS International

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 13 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-BACK TOP 14.37m above bottom (-2.63m TAW)

Processed by:

IMDC

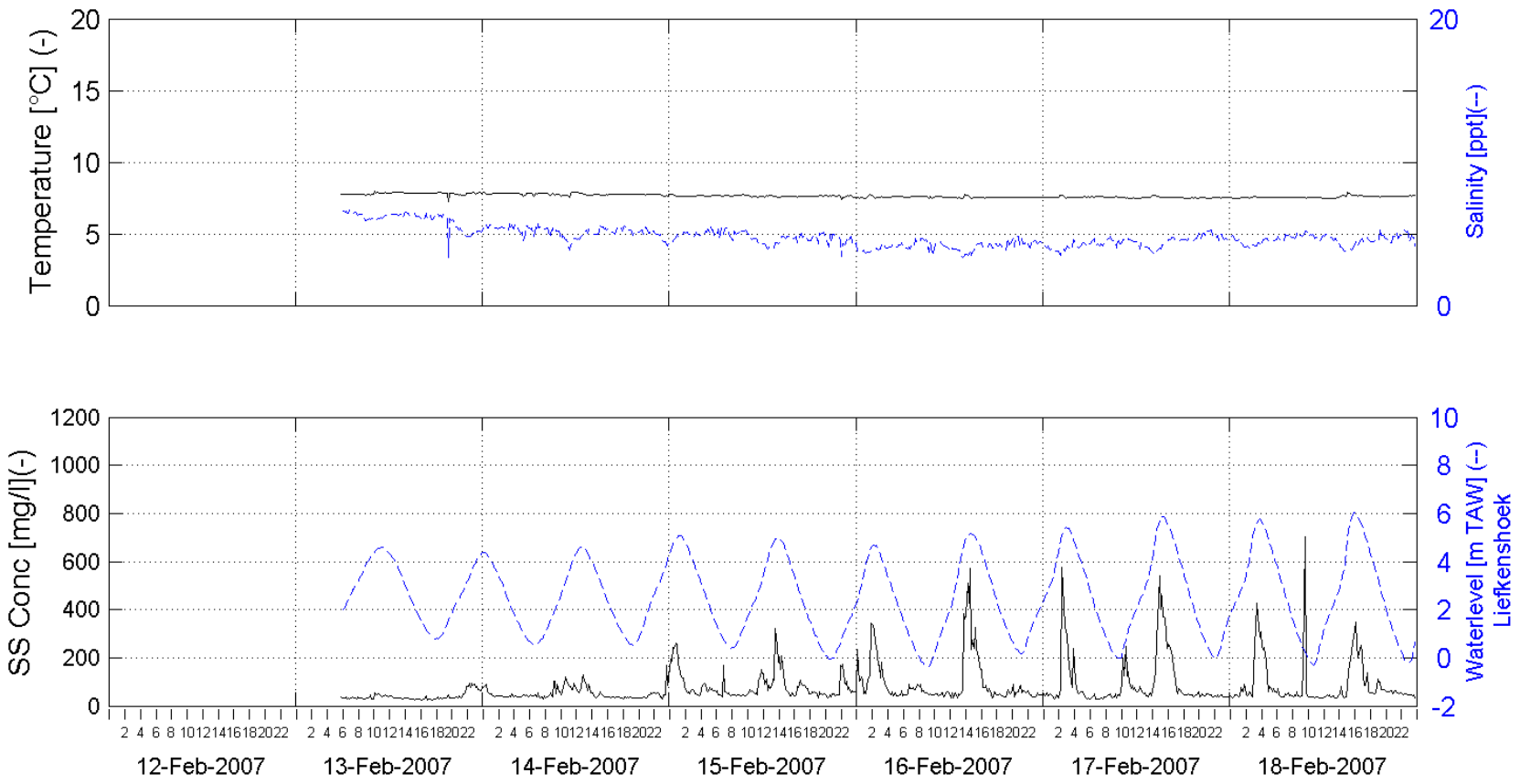
In Association with:

I/RA/11283/06.123/MSA

B.3 P&O 2 (S-ENTRANCE)

11283 - Long-term monitoring DGD - Winter 2007

Week 7 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-ENTRANCE BOTTOM 3.98m above bottom (-13.02m TAW)

Processed by:

IMDC

In Association with:

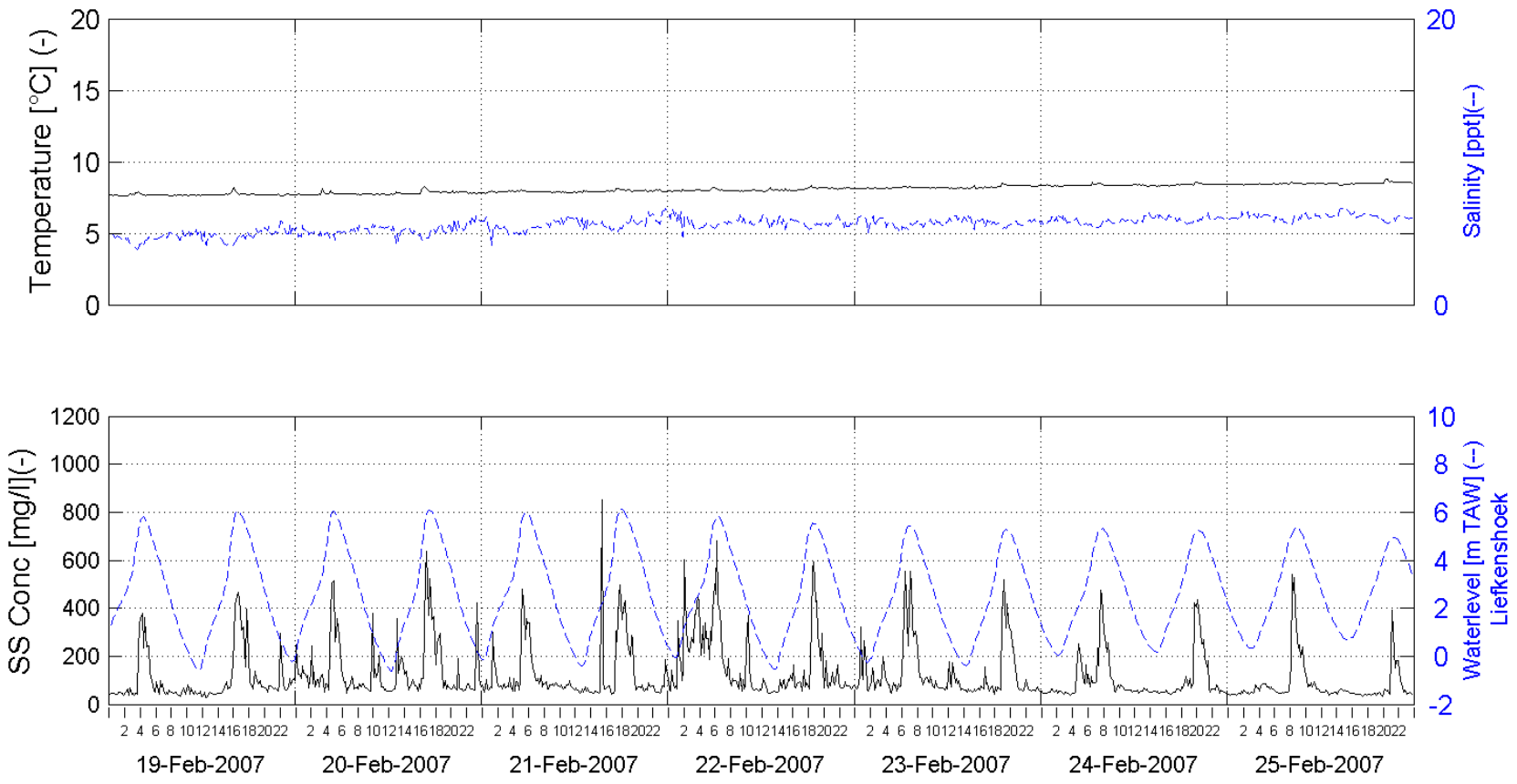
WL | delft hydraulics

GEMS International

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 8 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

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Processed by:

IMDC

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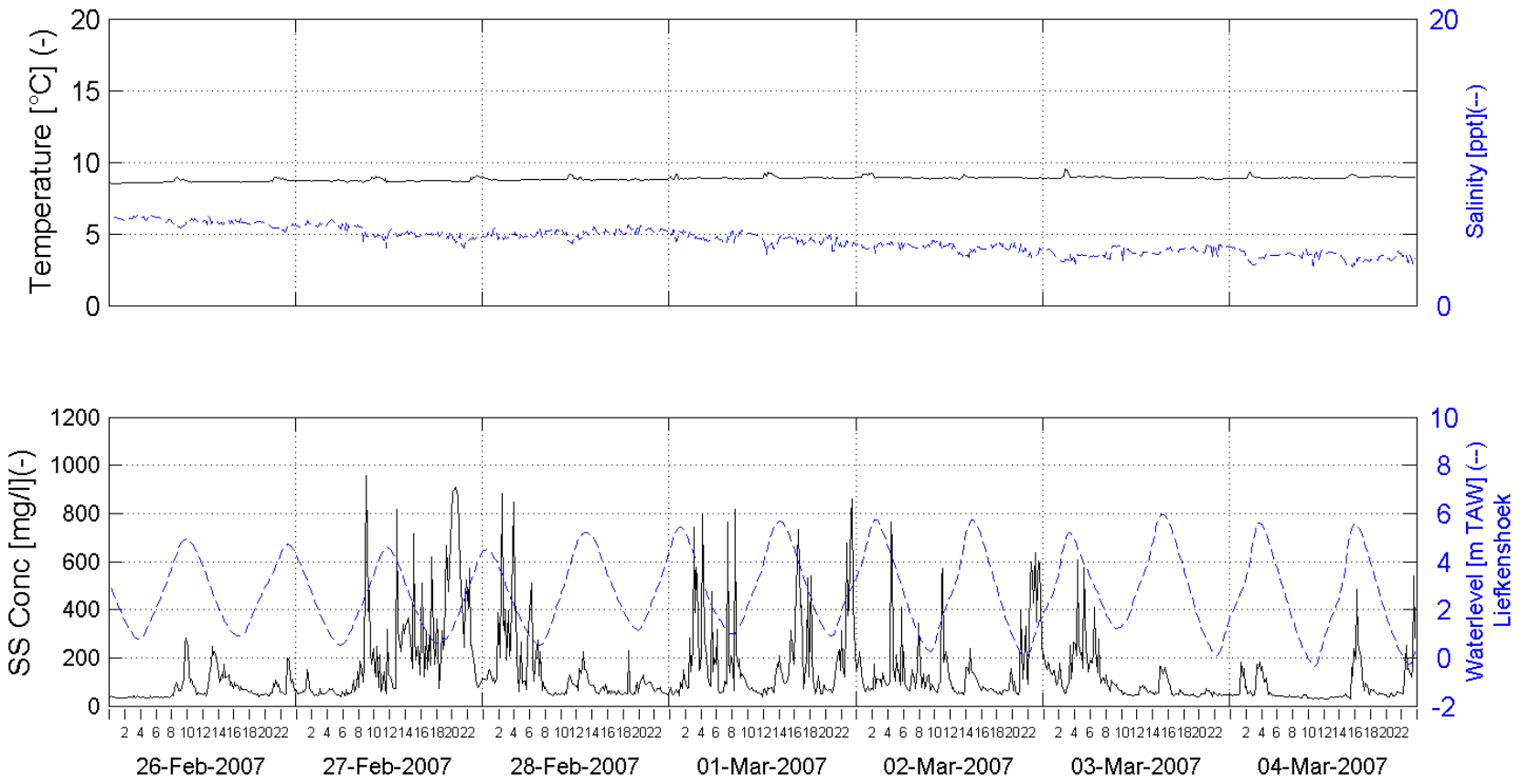
I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 9 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

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Processed by:

IMDC

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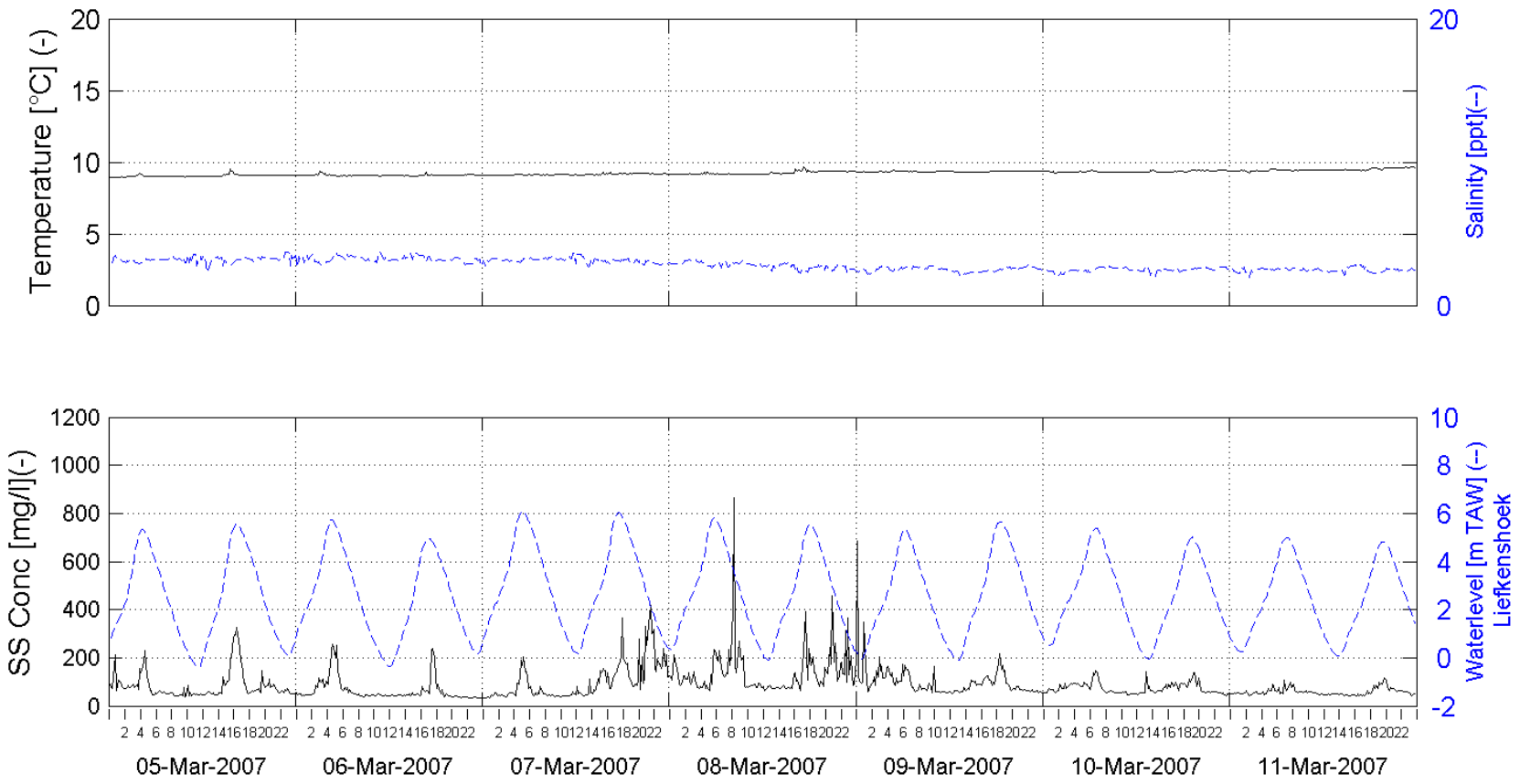
I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 10 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-ENTRANCE BOTTOM 3.98m above bottom (-13.02m TAW)

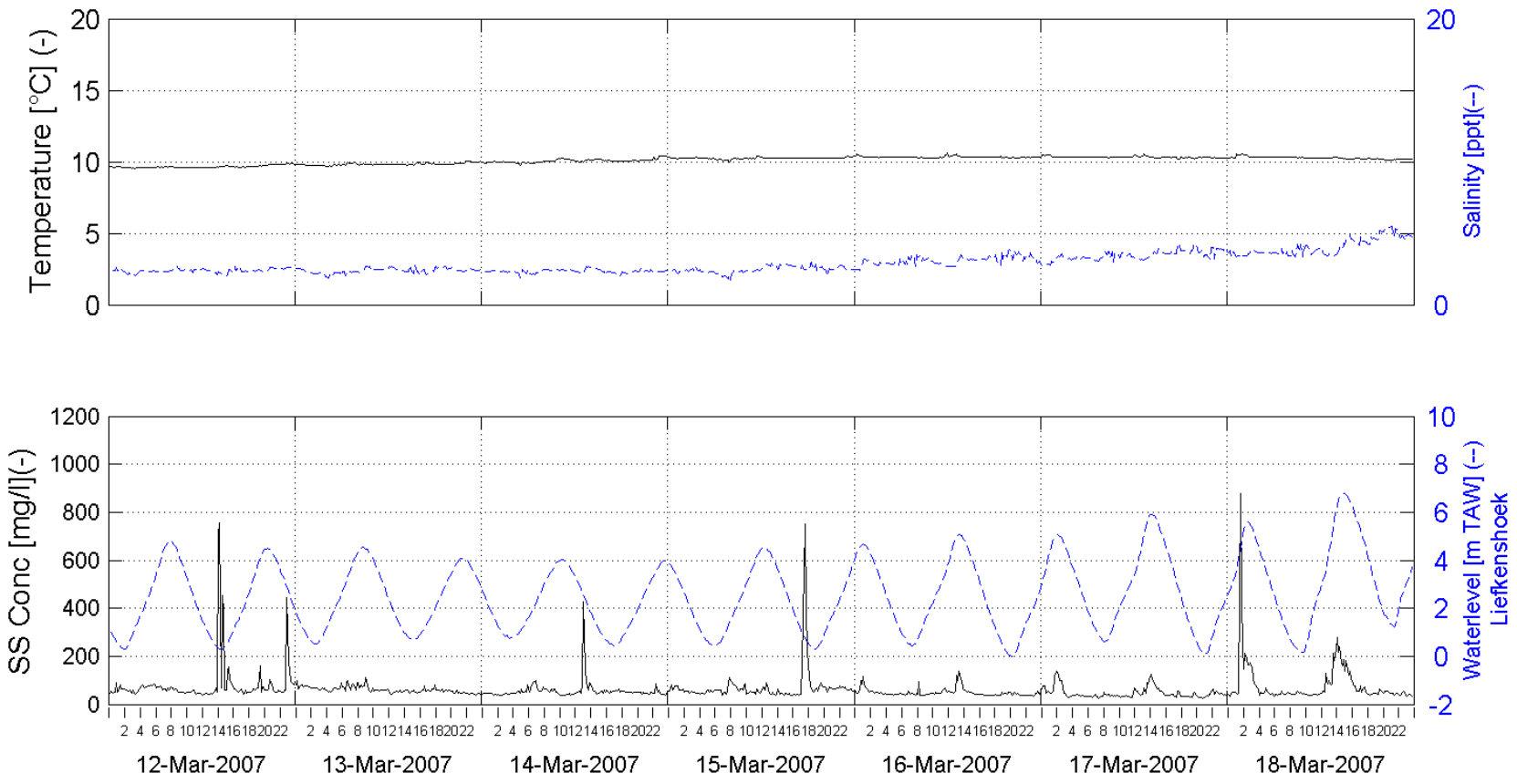
Processed by:

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 11 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

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Processed by:

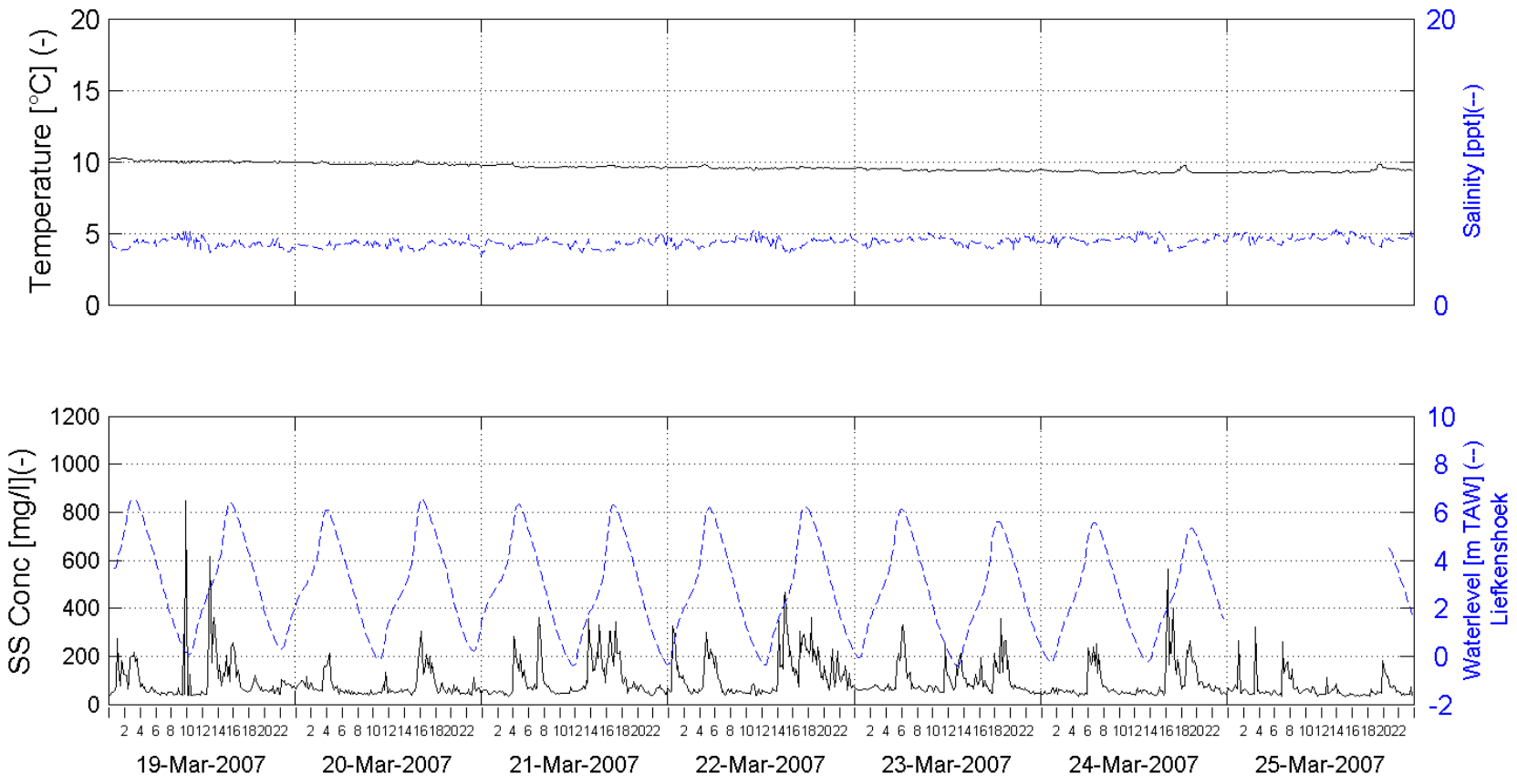
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 12 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

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Processed by:

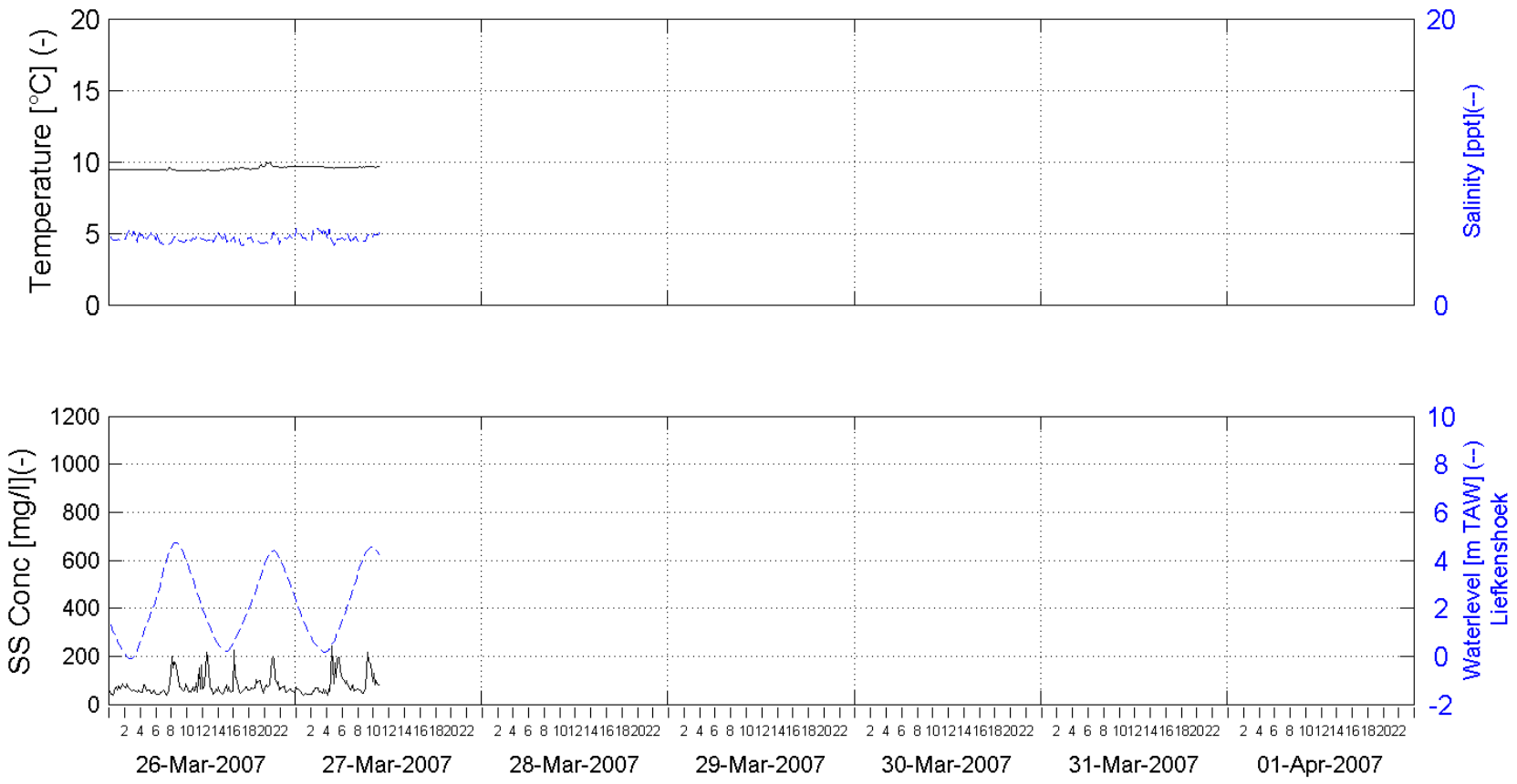
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 13 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

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Processed by:

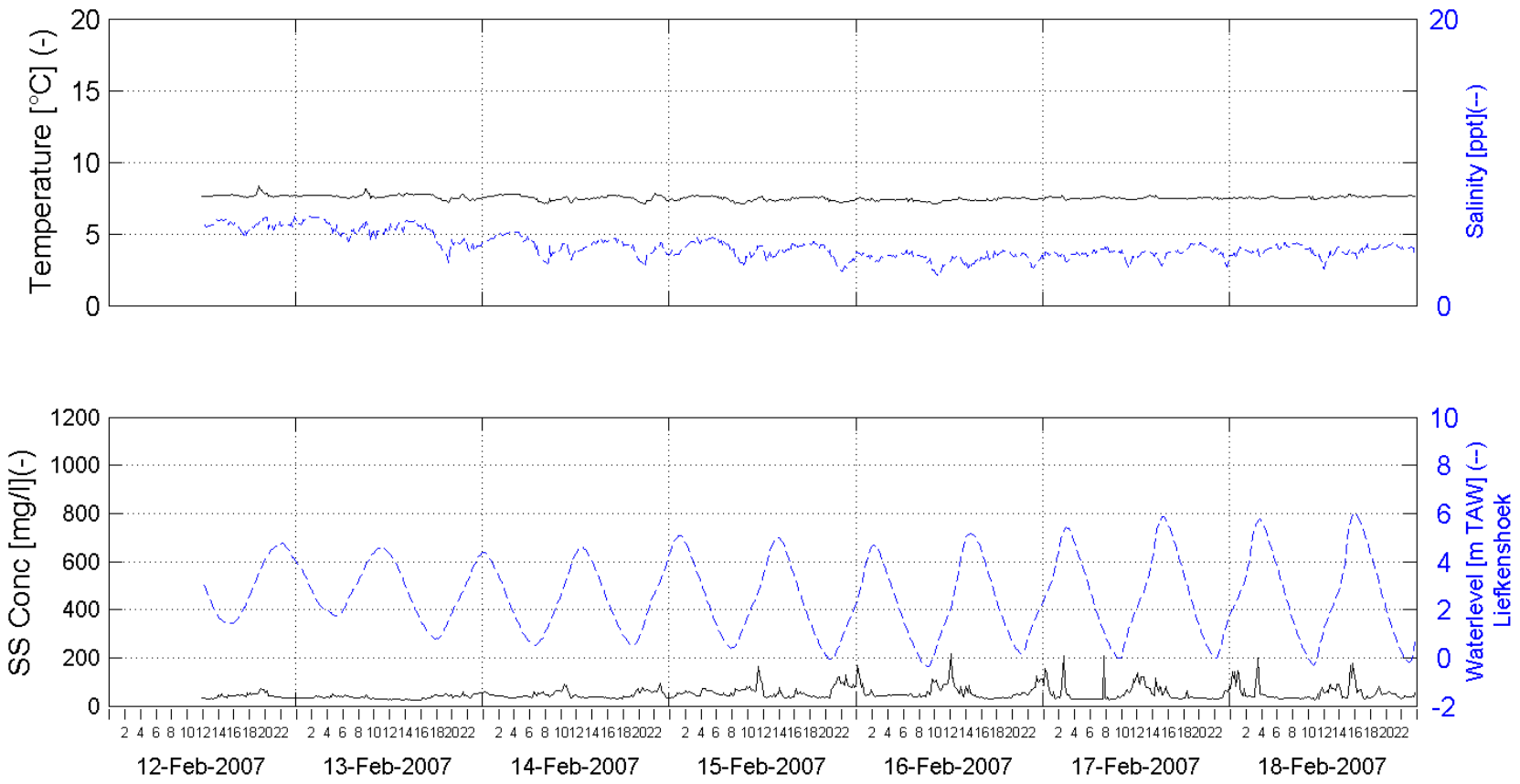
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 7 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-ENTRANCE TOP 14.8m above bottom (-2.2m TAW)

Processed by:

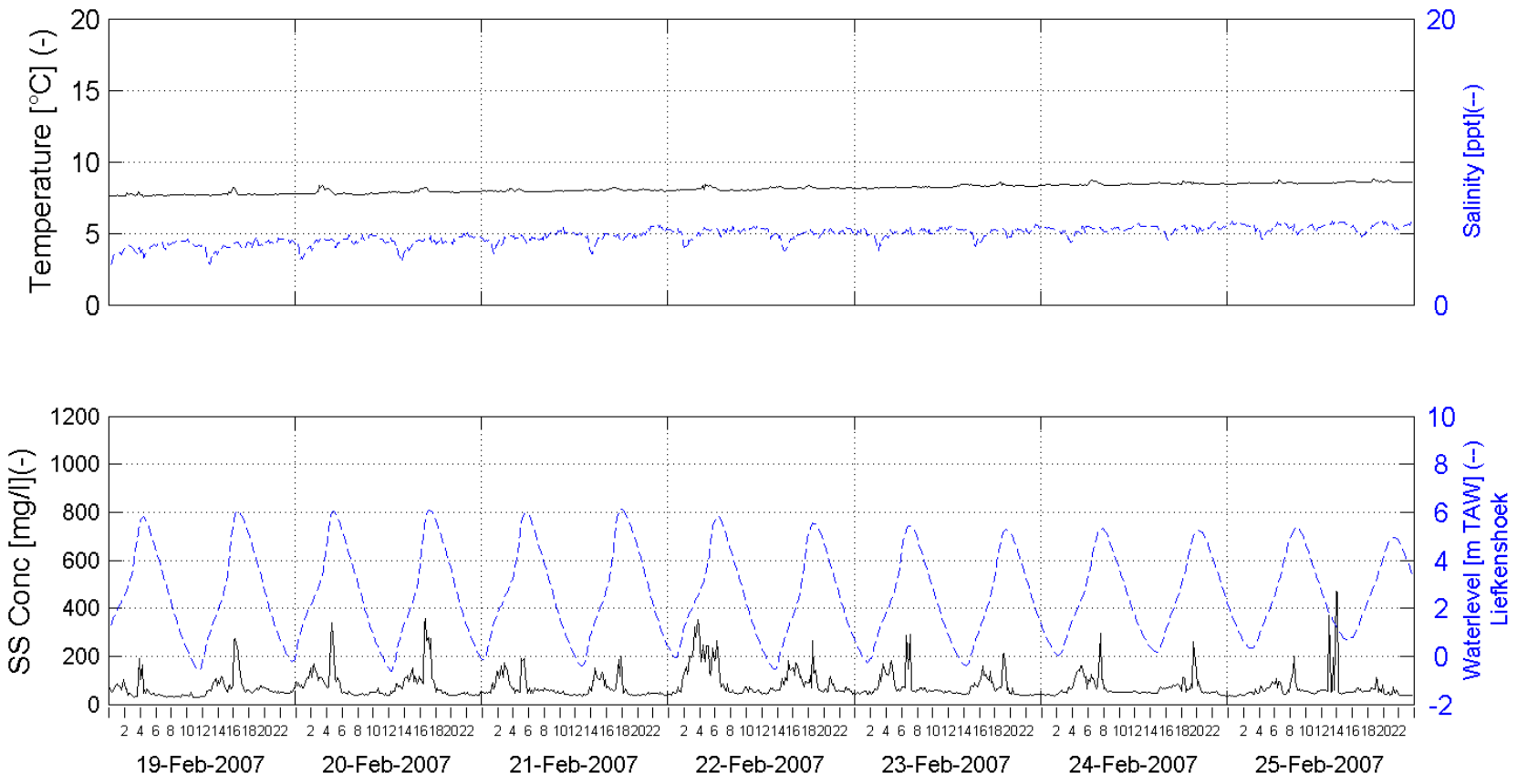
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 8 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-ENTRANCE TOP 14.8m above bottom (-2.2m TAW)

Processed by:

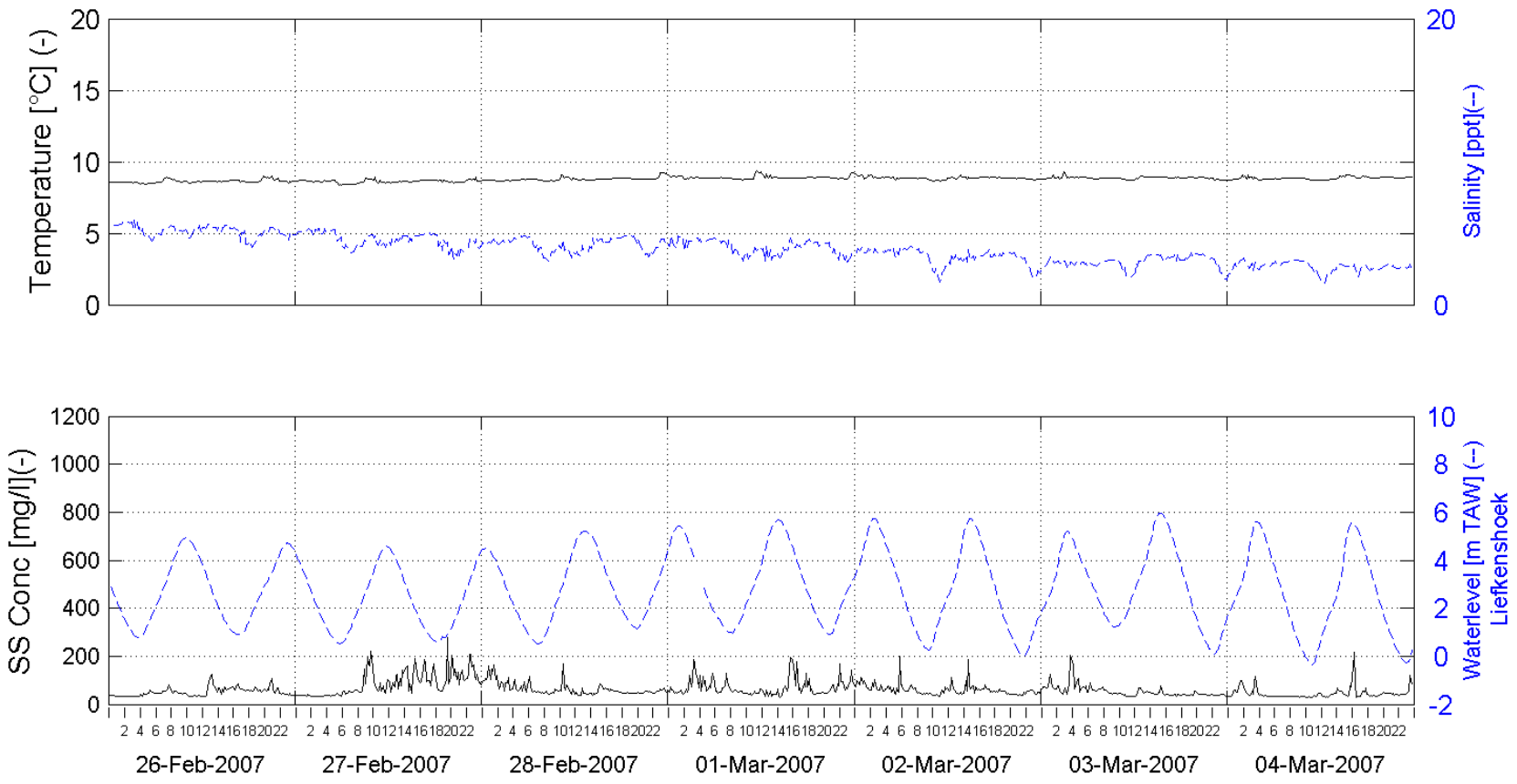
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 9 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-ENTRANCE TOP 14.8m above bottom (-2.2m TAW)

Processed by:

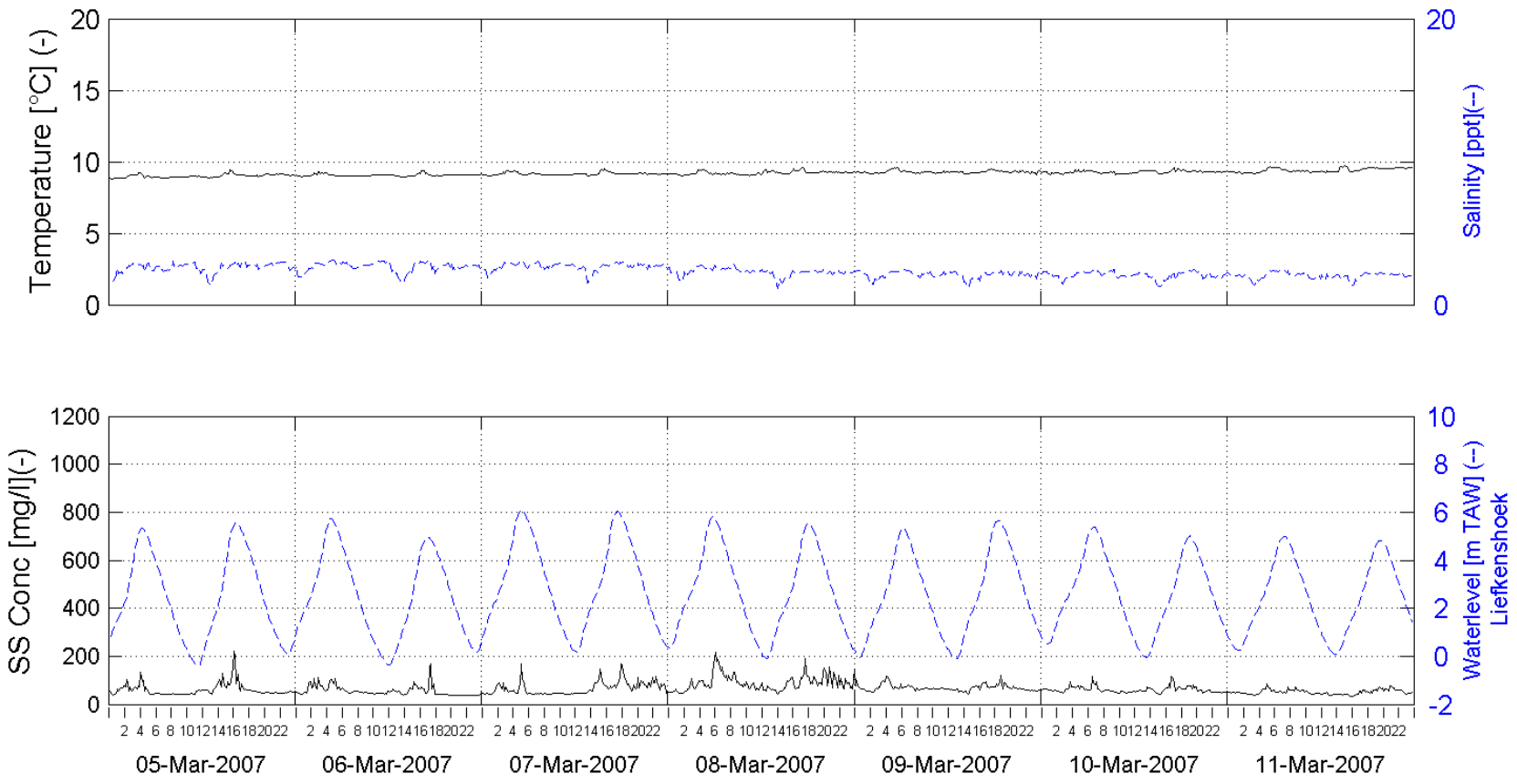
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 10 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-ENTRANCE TOP 14.8m above bottom (-2.2m TAW)

Processed by:

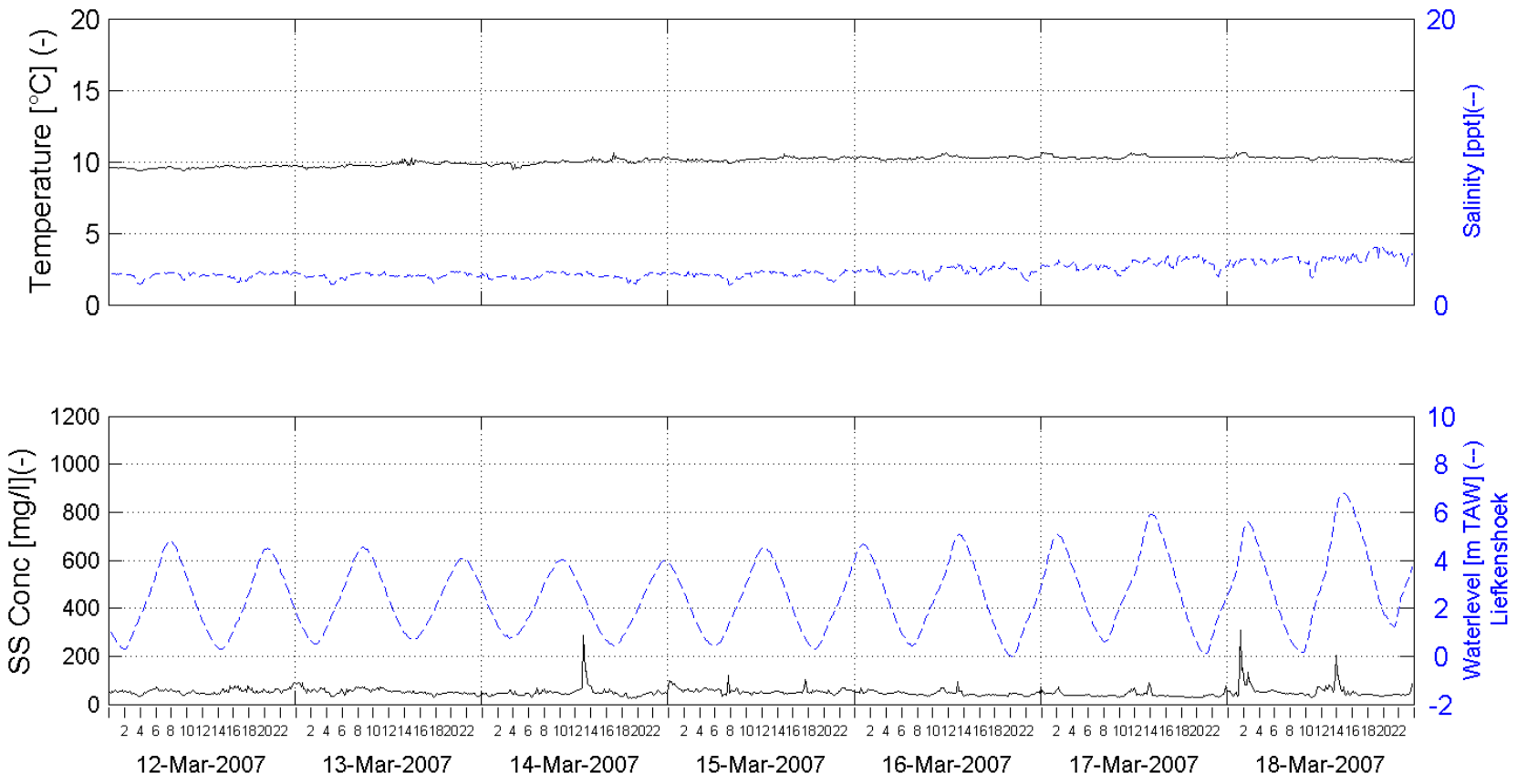
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 11 - 2007



Week series of Salinity, Temperature,
SS Concentration and Tide

Location:

S-ENTRANCE TOP 14.8m above bottom (-2.2m TAW)

Processed by:

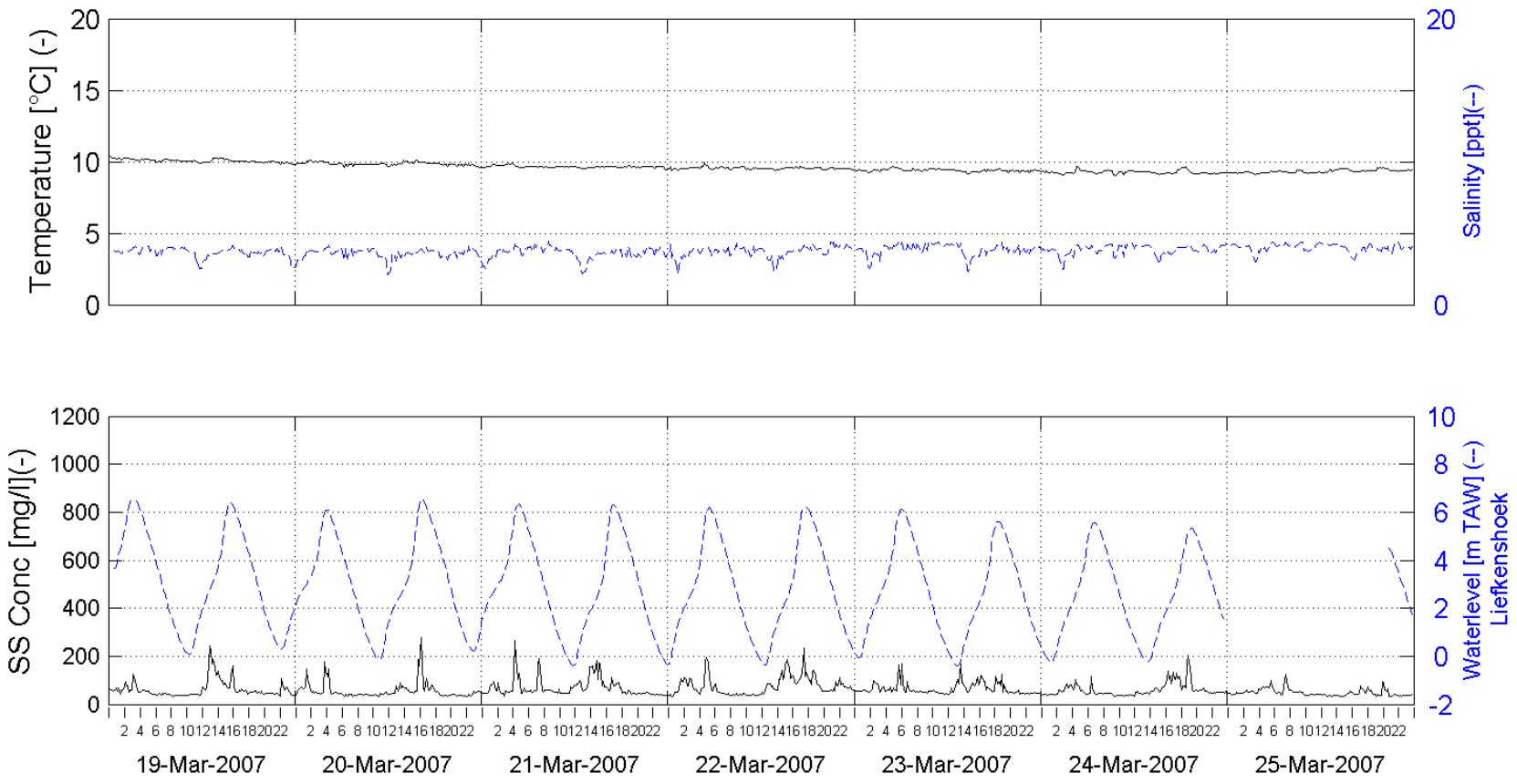
IMDC

In Association with:

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 12 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-ENTRANCE TOP 14.8m above bottom (-2.2m TAW)

Processed by:

IMDC

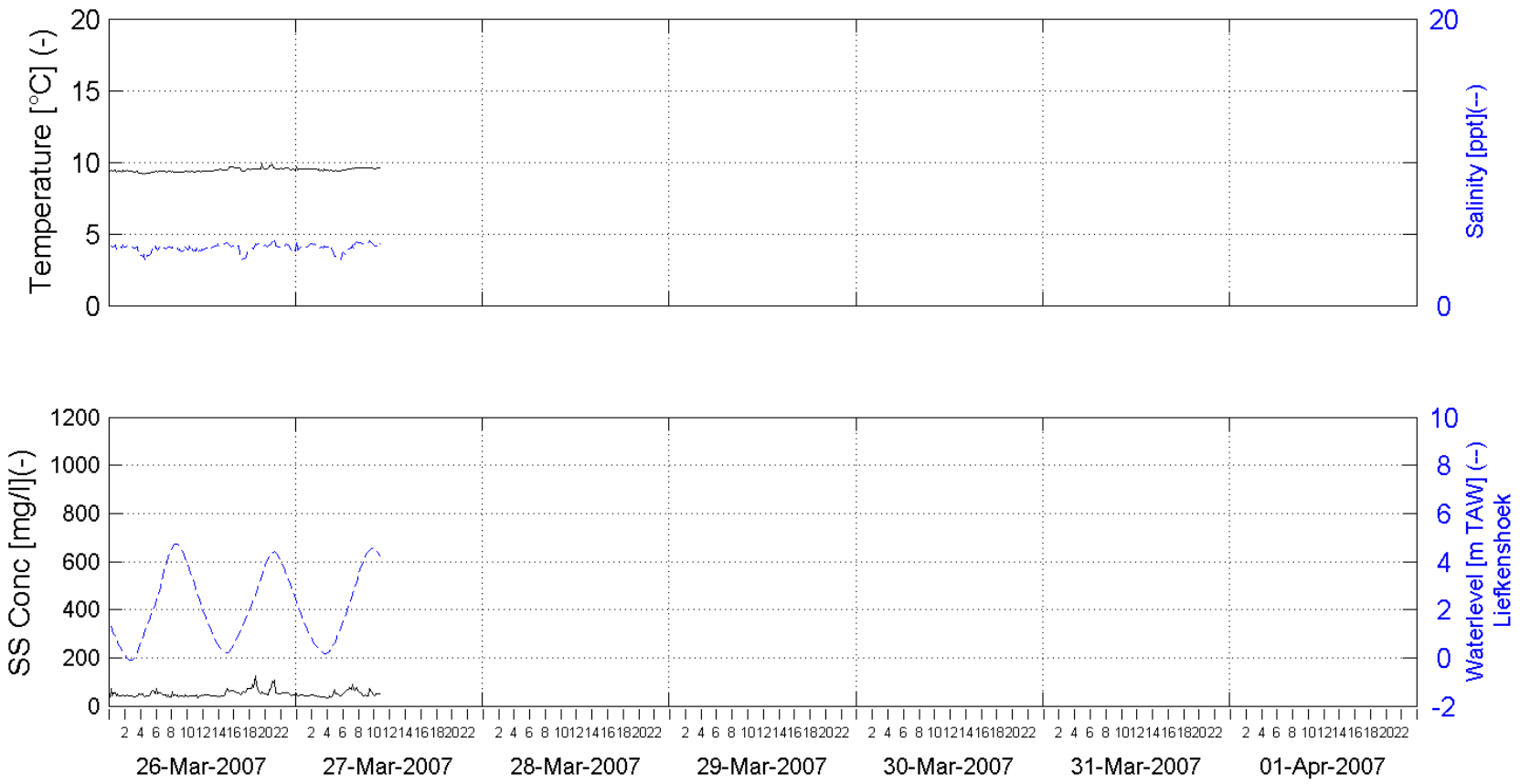
In Association with:

GEMS International

I/RA/11283/06.123/MSA

11283 - Long-term monitoring DGD - Winter 2007

Week 13 - 2007



Week series of Salinity, Temperature, SS Concentration and Tide

Location:

S-ENTRANCE TOP 14.8m above bottom (-2.2m TAW)

Processed by:

IMDC

In Association with:

GEMS International

I/RA/11283/06.123/MSA

APPENDIX C.

WEEKSERIES, AVERAGE TIDE & TABLES

ARGUS ASM – IV & ALTUS (MET TIME)

C.1 CDW frame

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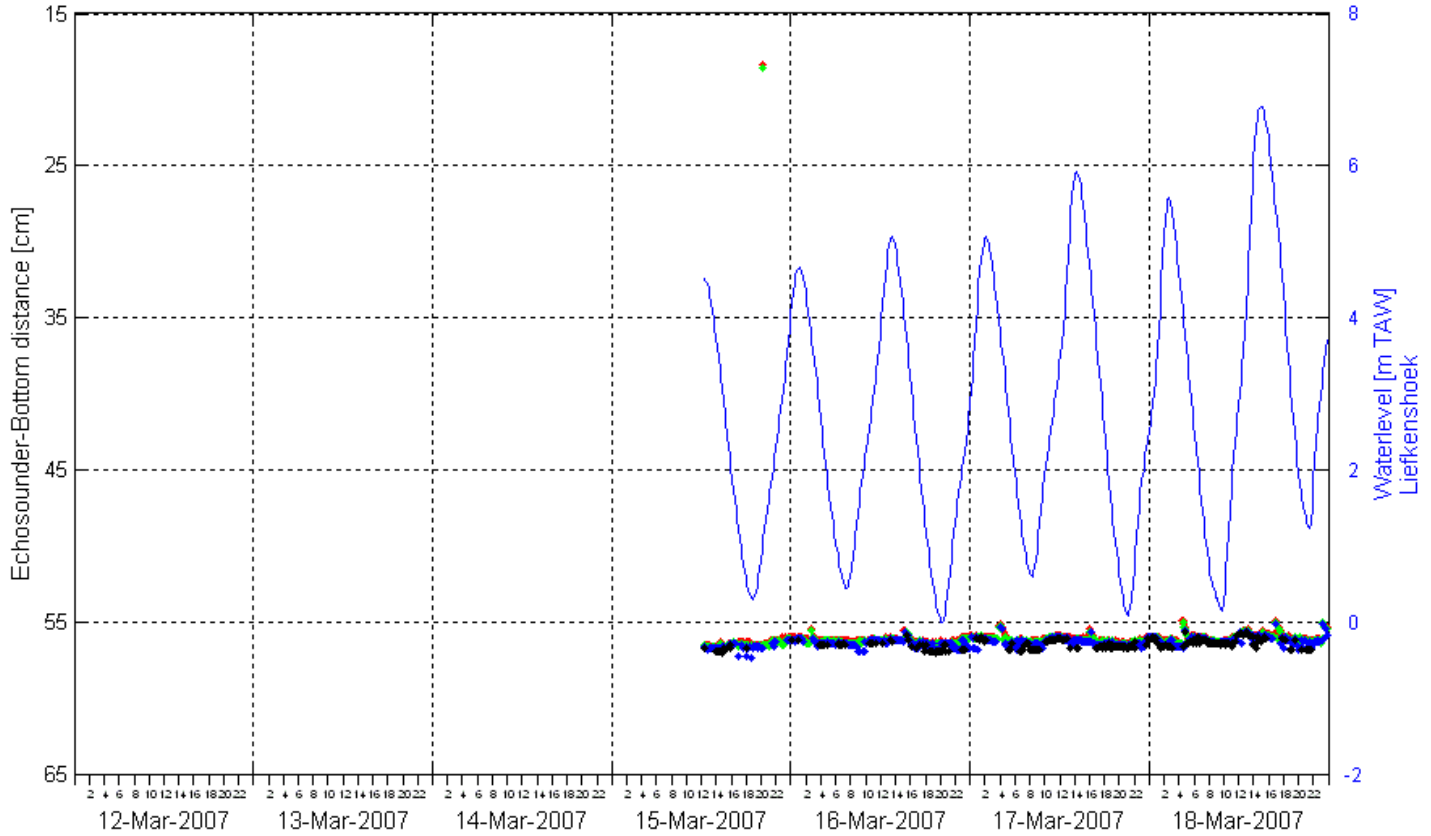
11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007

NO DATA

Time series suspended sediment concentration ARGUS ASM-IV		*Data processed by:* IMDC
Location: Deurganckdok CDW	Date: 15/03/2007 – 28/03/2007	*In association with:* WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:	Date:
Deurganckdok CDW	15/03/2007 – 18/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

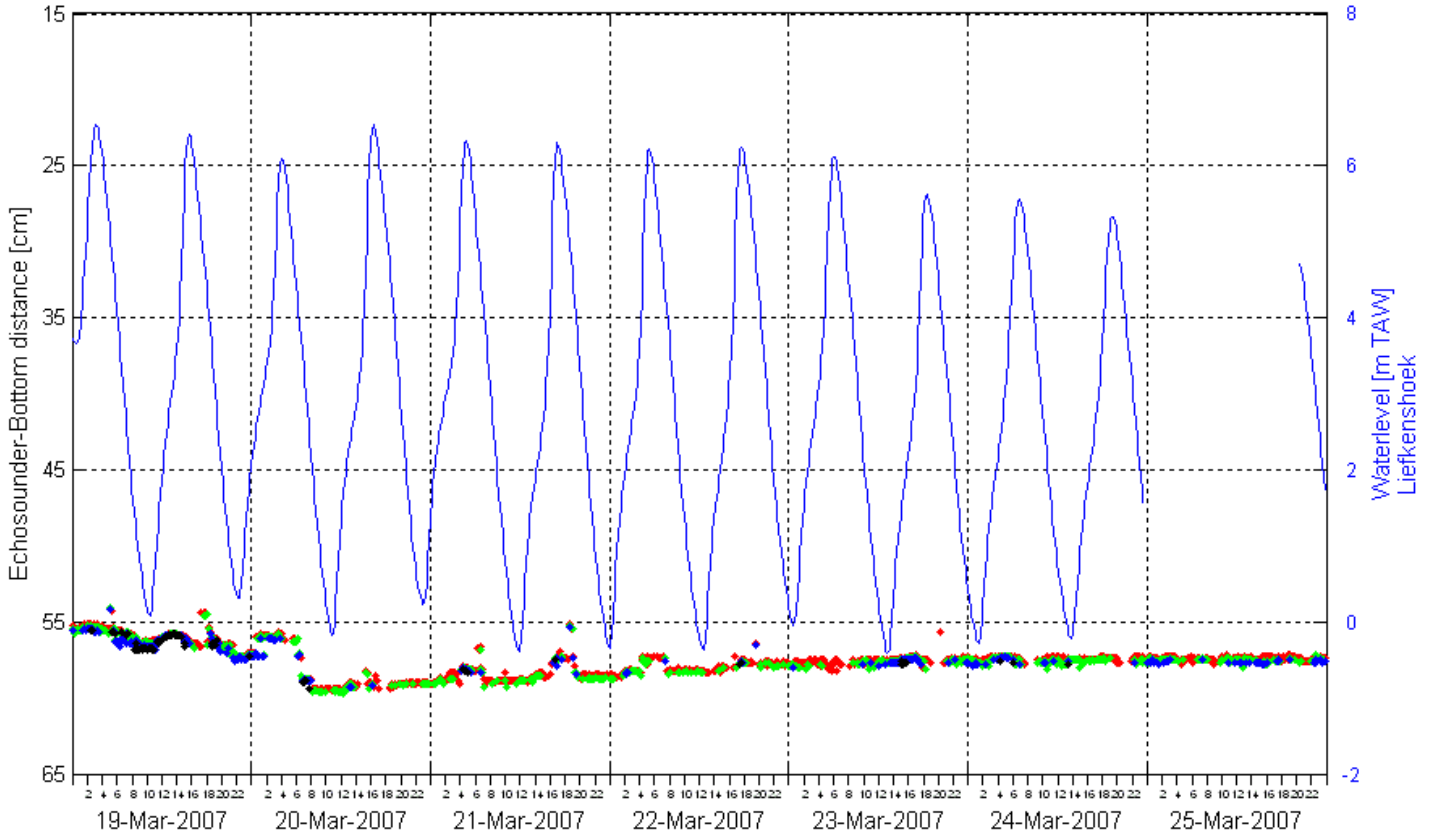
11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007

NO DATA

Time series suspended sediment concentration ARGUS ASM-IV		*Data processed by:* IMDC
Location: Deurganckdok CDW	Date: 19/03/2007 – 25/03/2007	*In association with:* WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok CDW

Date:
19/03/2007 – 25/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

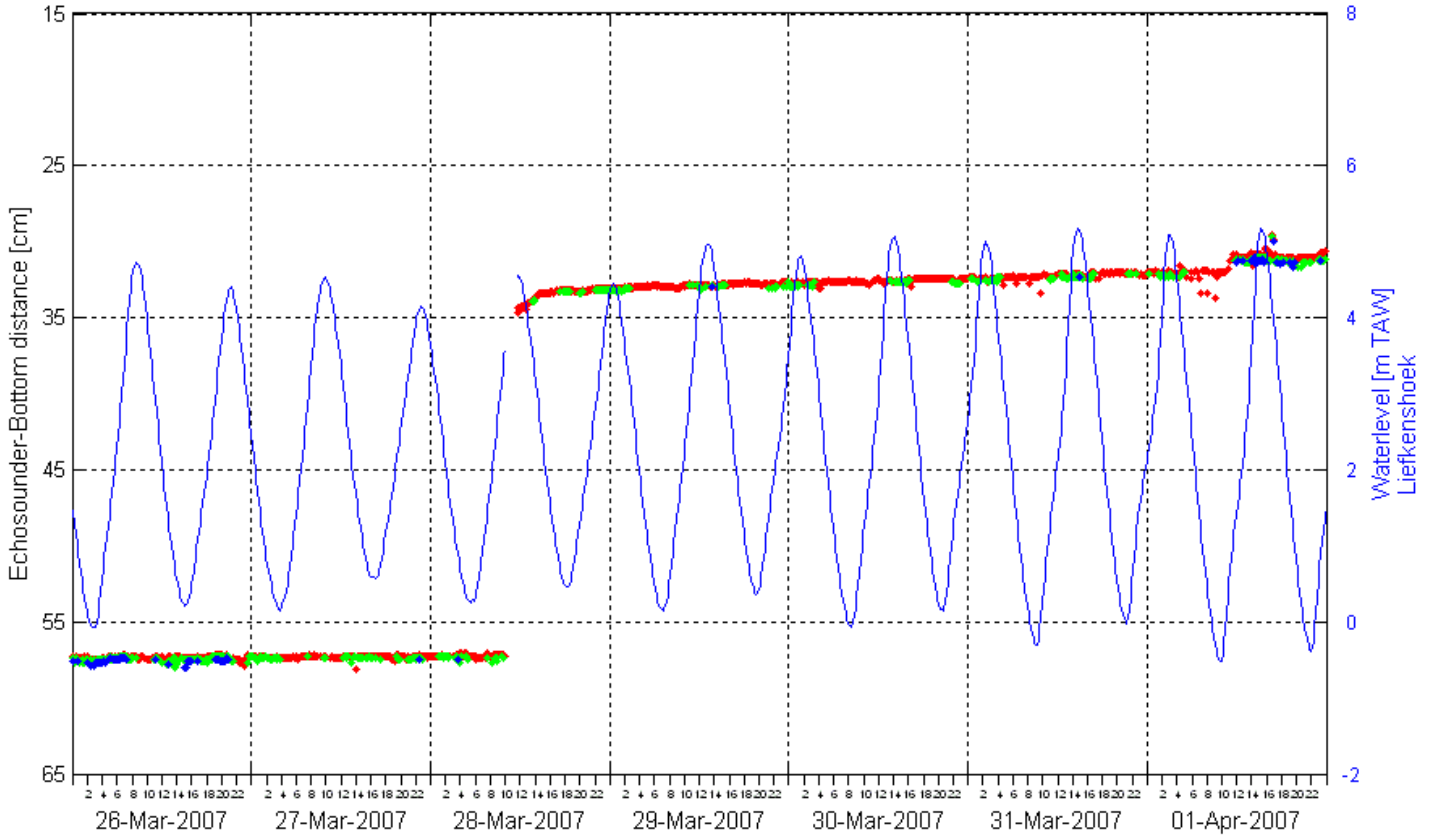
11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007

NO DATA

Time series suspended sediment concentration ARGUS ASM-IV		*Data processed by:* IMDC
Location: Deurganckdok CDW	Date: 26/03/2007 – 01/04/2007	*In association with:* WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok CDW

Date:
26/03/2007 – 01/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

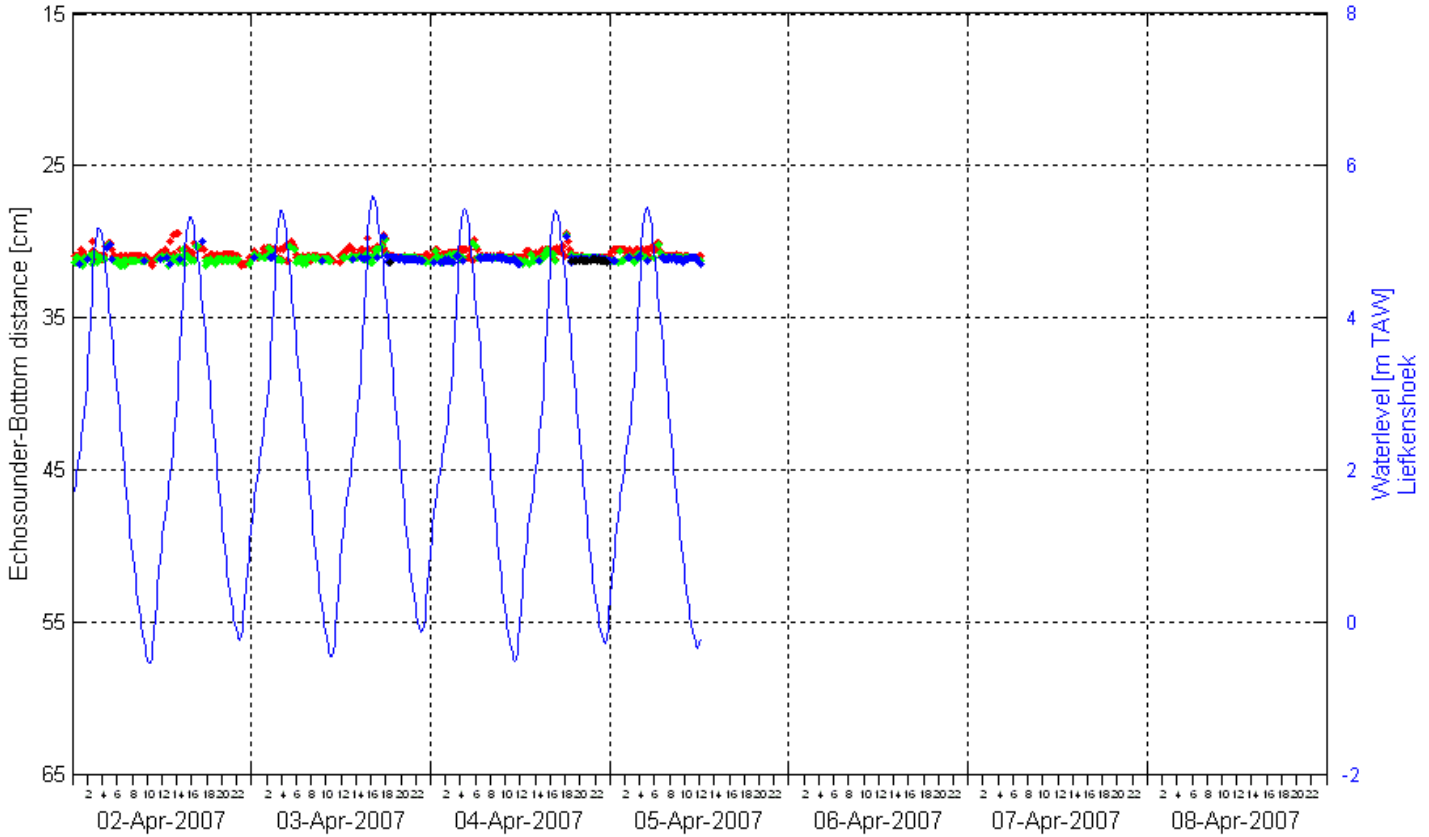
11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007

NO DATA

Time series suspended sediment concentration ARGUS ASM-IV		*Data processed by:* IMDC
Location: Deurganckdok CDW	Date: 02/04/2007 – 05/04/2007	*In association with:* WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok CDW

Date:
02/04/2007 – 05/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

ALTUS Echosounder bottom distance [cm]

Date	Tide no.	Phase	Signal 1	Signal 2	Signal 3	Signal 4
20070316	1	flood	56.04	56.21	56.29	-
20070316	1	ebb	56.21	56.37	56.41	-
20070316	2	flood	56.04	56.08	56.13	56.25
20070316	2	ebb	56.37	56.45	56.86	56.99
20070317	3	flood	56.04	56.08	56.13	56.29
20070317	3	ebb	56.29	56.29	56.41	56.45
20070317	4	flood	56.13	56.17	56.25	-
20070317	4	ebb	56.37	56.45	56.58	56.66
20070318	5	flood	56.37	56.37	56.49	56.62
20070318	5	ebb	56.29	56.29	56.33	56.49
20070318	6	flood	55.84	55.92	55.92	56
20070318	6	ebb	56.29	56.29	56.66	56.86
20070319	7	flood	55.18	55.34	55.63	-
20070319	7	ebb	56.37	56.45	56.66	56.86
20070319	8	flood	56.21	56.29	56.33	-
20070319	8	ebb	57.27	57.31	57.44	-
20070320	9	flood	55.96	56.13	-	-
20070320	9	ebb	59.45	-	-	-
20070320	10	flood	59.24	-	-	-
20070320	10	ebb	59.08	-	-	-
20070321	11	flood	58.05	58.09	58.14	58.22
20070321	11	ebb	58.88	59.12	-	-
20070321	12	flood	57.44	57.48	57.93	-
20070321	12	ebb	58.47	-	-	-
20070322	13	flood	57.27	57.6	-	-
20070322	13	ebb	58.18	58.38	-	-
20070322	14	flood	57.69	57.69	57.77	57.85
20070323	14	ebb	57.77	57.85	-	-
20070323	15	flood	57.81	-	-	-
20070323	15	ebb	57.64	57.69	57.77	-
20070323	16	flood	57.48	58.14	-	-
20070324	16	ebb	57.56	57.69	57.73	-
20070324	17	flood	57.36	57.44	-	-
20070324	17	ebb	57.44	57.52	-	-
20070324	18	flood	57.36	57.4	-	-
20070325	18	ebb	57.44	57.48	-	-
20070325	19	flood	57.36	57.52	-	-
20070325	19	ebb	57.48	-	-	-
20070325	20	flood	57.4	-	-	-
20070326	21	ebb	57.27	57.4	-	-
20070326	21	flood	57.36	57.4	-	-
20070326	22	ebb	57.36	57.48	-	-

ALTUS Echosounder bottom distance [cm]

Date	Tide no.	Phase	Signal 1	Signal 2	Signal 3	Signal 4
20070326	22	flood	57.31	57.44	-	-
20070327	23	ebb	-	-	-	-
20070327	23	flood	57.31	57.36	-	-
20070327	24	ebb	57.19	57.36	57.44	-
20070327	24	flood	57.31	57.44	-	-
20070328	25	ebb	34.33	-	-	-
20070328	25	flood	33.22	33.3	-	-
20070328	26	ebb	33.09	33.14	-	-
20070329	26	flood	32.93	-	-	-
20070329	27	ebb	32.85	33.01	-	-
20070329	27	flood	32.73	-	-	-
20070329	28	ebb	32.73	32.85	-	-
20070330	28	flood	32.56	-	-	-
20070330	29	ebb	32.69	-	-	-
20070330	29	flood	32.48	-	-	-
20070330	30	ebb	32.4	-	-	-
20070331	30	flood	-	-	-	-
20070331	31	ebb	32.15	32.27	-	-
20070331	31	flood	32.07	-	-	-
20070331	32	ebb	31.95	-	-	-
20070401	32	flood	32.27	-	-	-
20070401	33	ebb	31	31.13	31.25	-
20070401	33	flood	31.08	31.37	-	-
20070401	34	ebb	30.92	30.96	-	-
20070402	34	flood	30.96	31.29	-	-
20070402	35	ebb	30.51	30.96	-	-
20070402	35	flood	30.92	31.13	-	-
20070403	36	flood	30.55	-	-	-
20070403	36	ebb	31.04	31.25	-	-
20070403	37	flood	31.17	31.33	-	-
20070403	37	ebb	31.04	31.13	31.13	-
20070404	38	flood	30.55	31	31.25	-
20070404	38	ebb	31	31.13	31.13	-
20070404	39	flood	30.47	30.88	-	-
20070404	39	ebb	31	31.13	31.13	31.21
20070405	40	flood	30.8	31	-	-
20070405	40	ebb	31	31.08	31.08	-

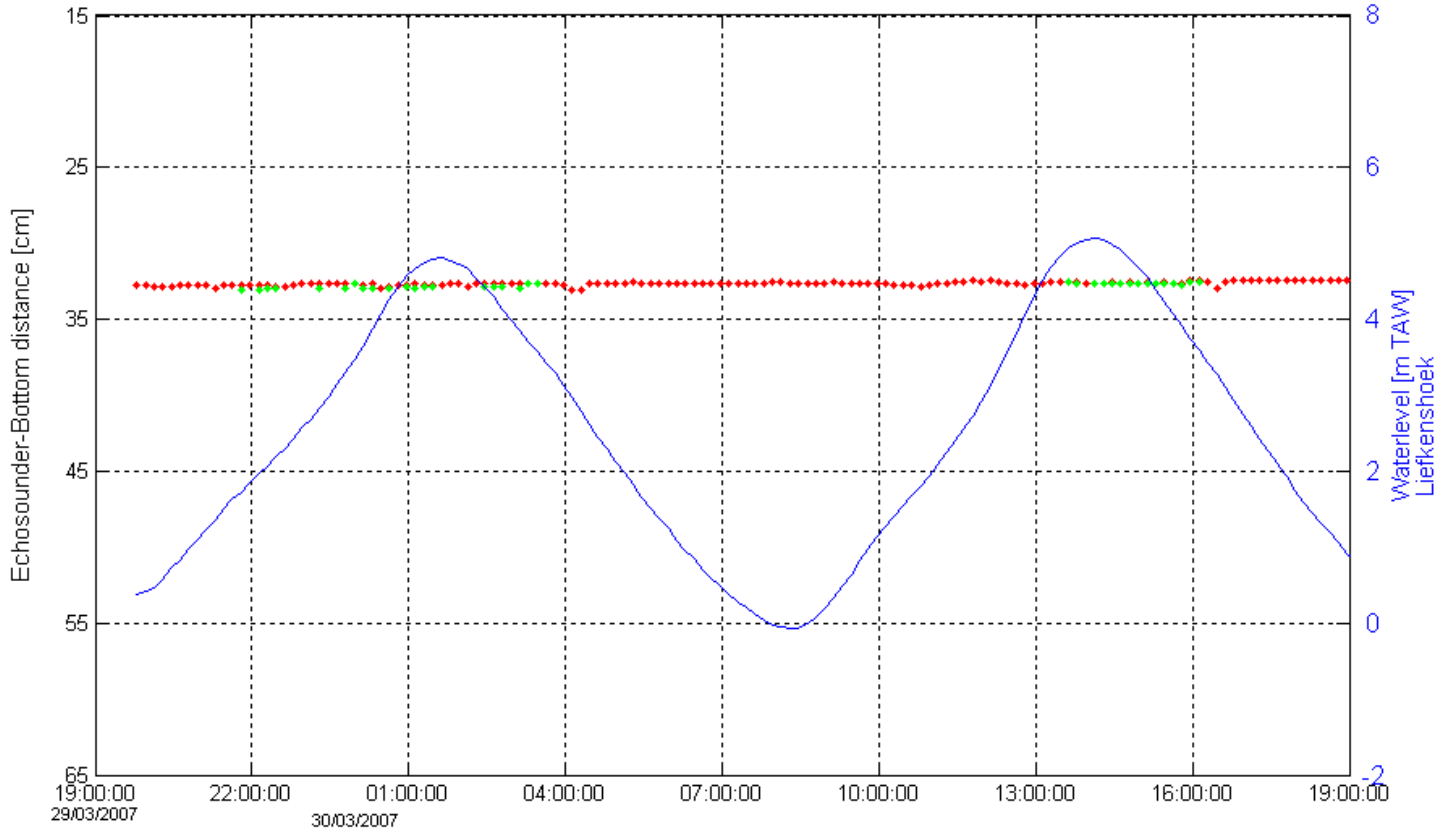
11283 Accretion Deurganckok - Near bed continuous monitoring – Winter 2007

NO DATA

Time series suspended sediment concentration ARGUS ASM-IV		*Data processed by:* IMDC
Location: Deurganckdok CDW	Date: Avg Tide 29/03 – 30/03	*In association with:* WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok CDW

Date:
Avg Tide 29/03 – 30/03

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

C.2 Sill frame

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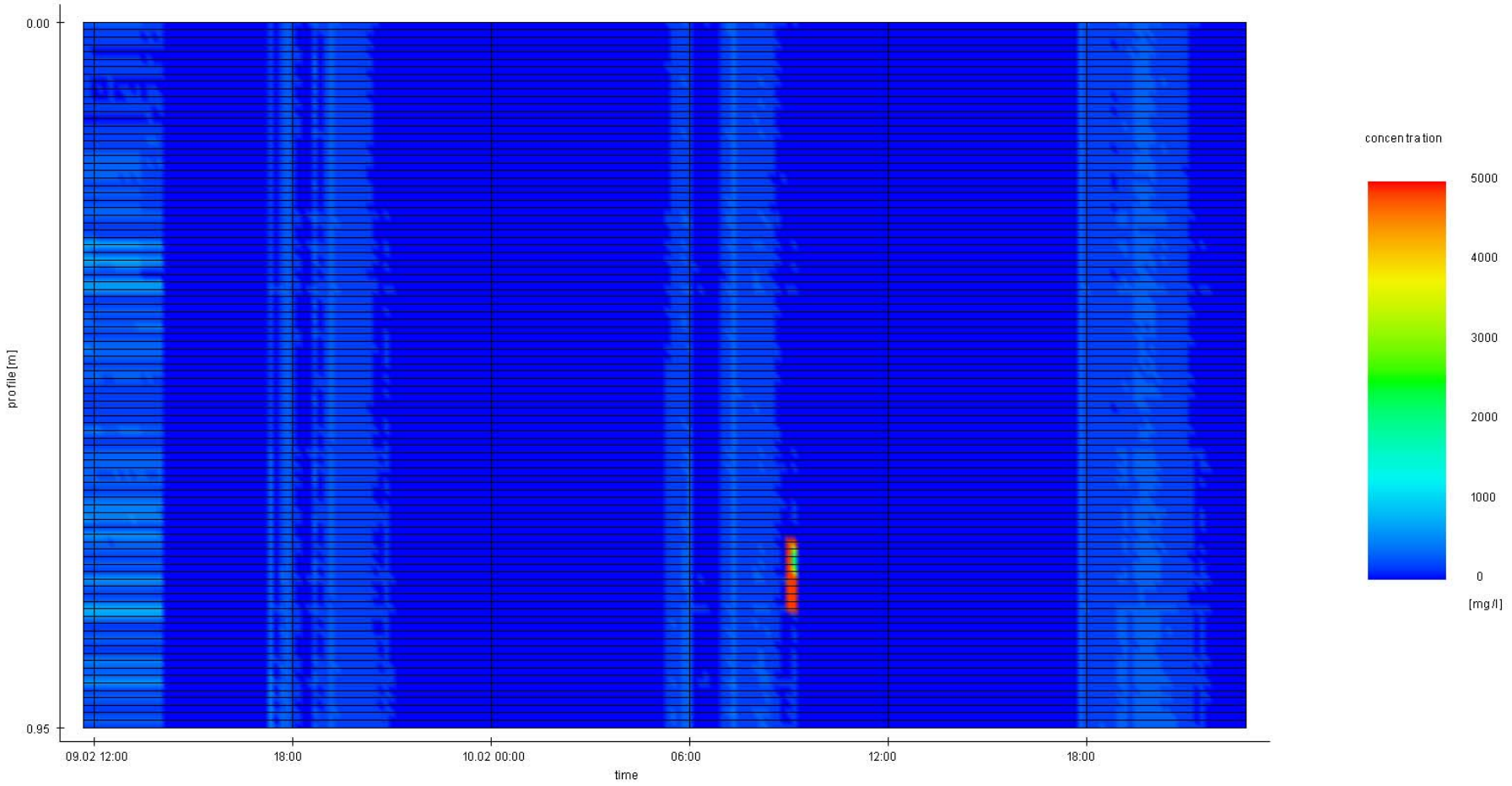
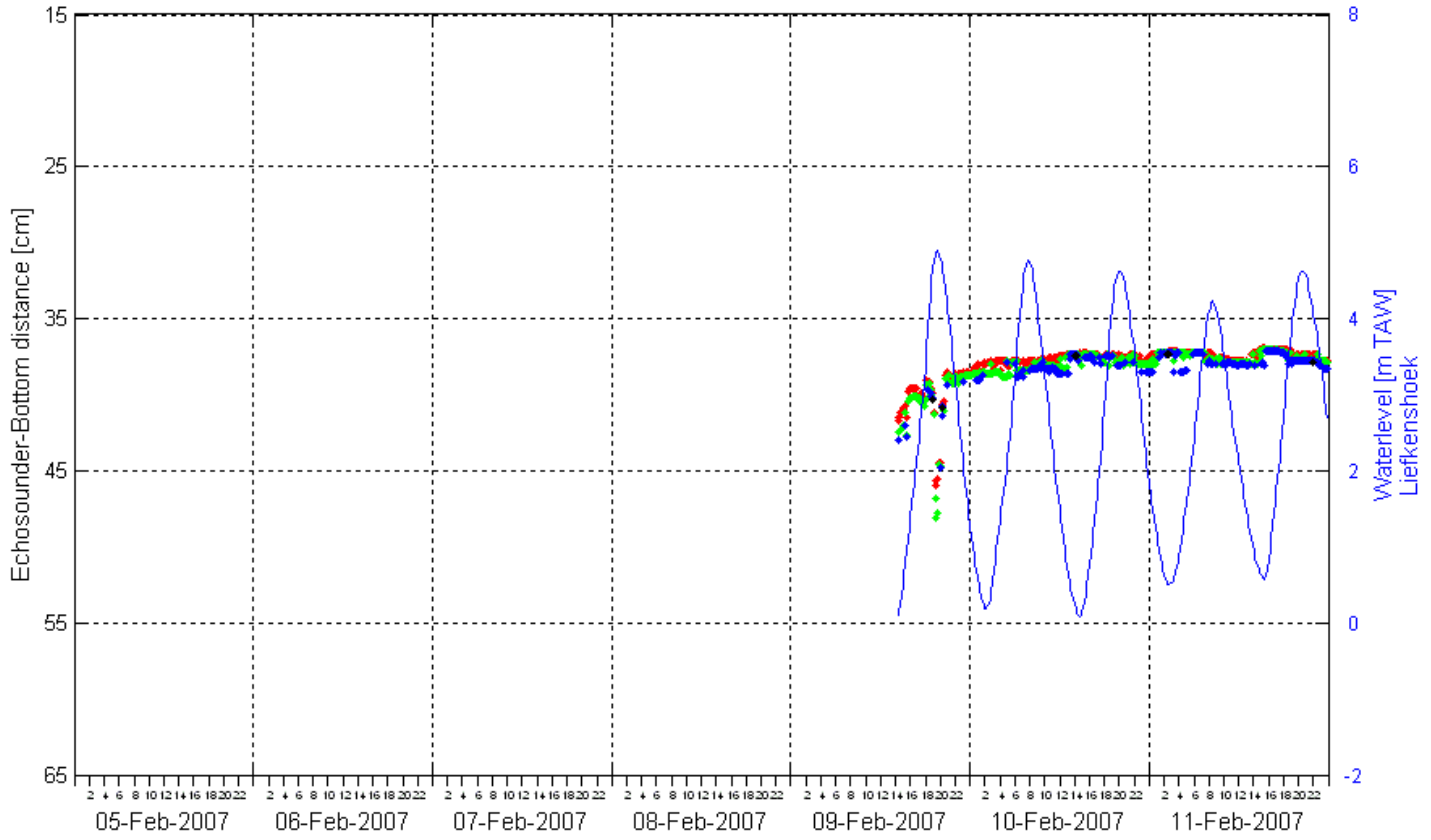
11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration ARGUS ASM-IV		Data processed by: IMDC
Location: Deurganckdok Sill	Date: 09/02/2007 – 11/02/2007	In association with: wl | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

Date:
09/02/2007 – 11/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

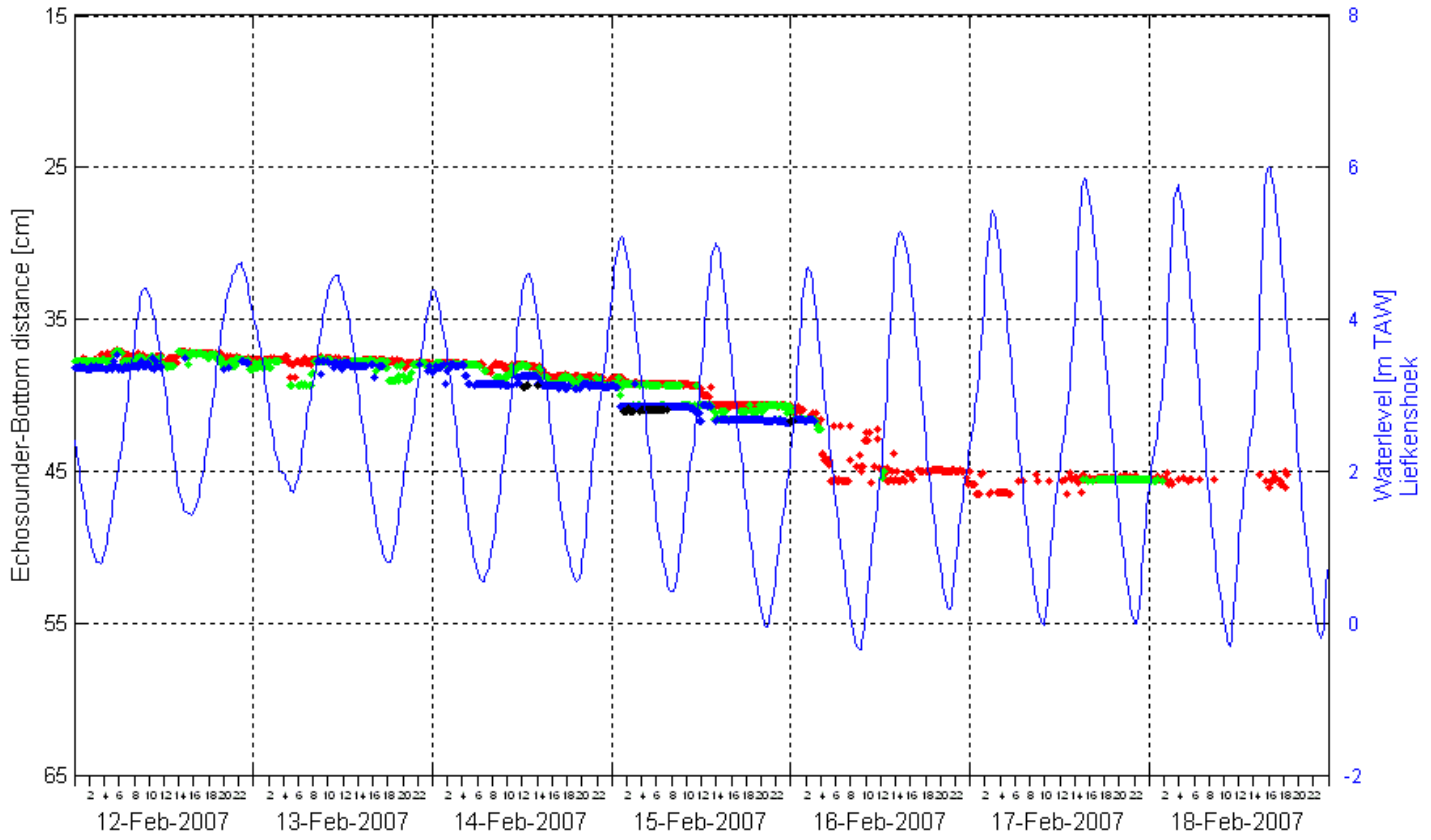
11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007

NO DATA

Time series suspended sediment concentration ARGUS ASM-IV		*Data processed by:* IMDC
Location: Deurganckdok Sill	Date: 12/02/2007 – 18/02/2007	*In association with:* WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

Date:
12/02/2007 – 18/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

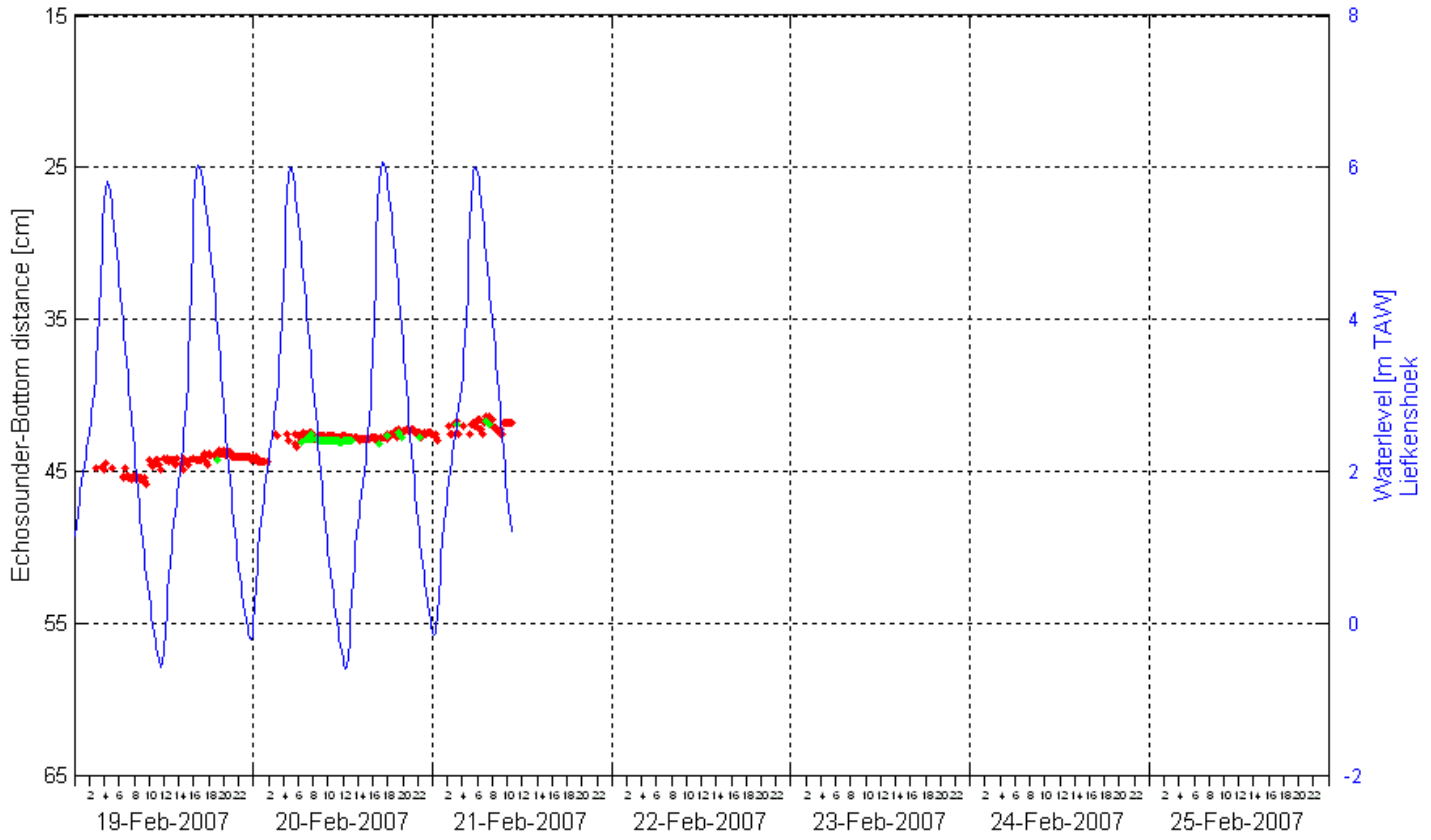
11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007

NO DATA

Time series suspended sediment concentration ARGUS ASM-IV		*Data processed by:* IMDC
Location: Deurganckdok Sill	Date: 19/02/2007 – 21/02/2007	*In association with:* WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

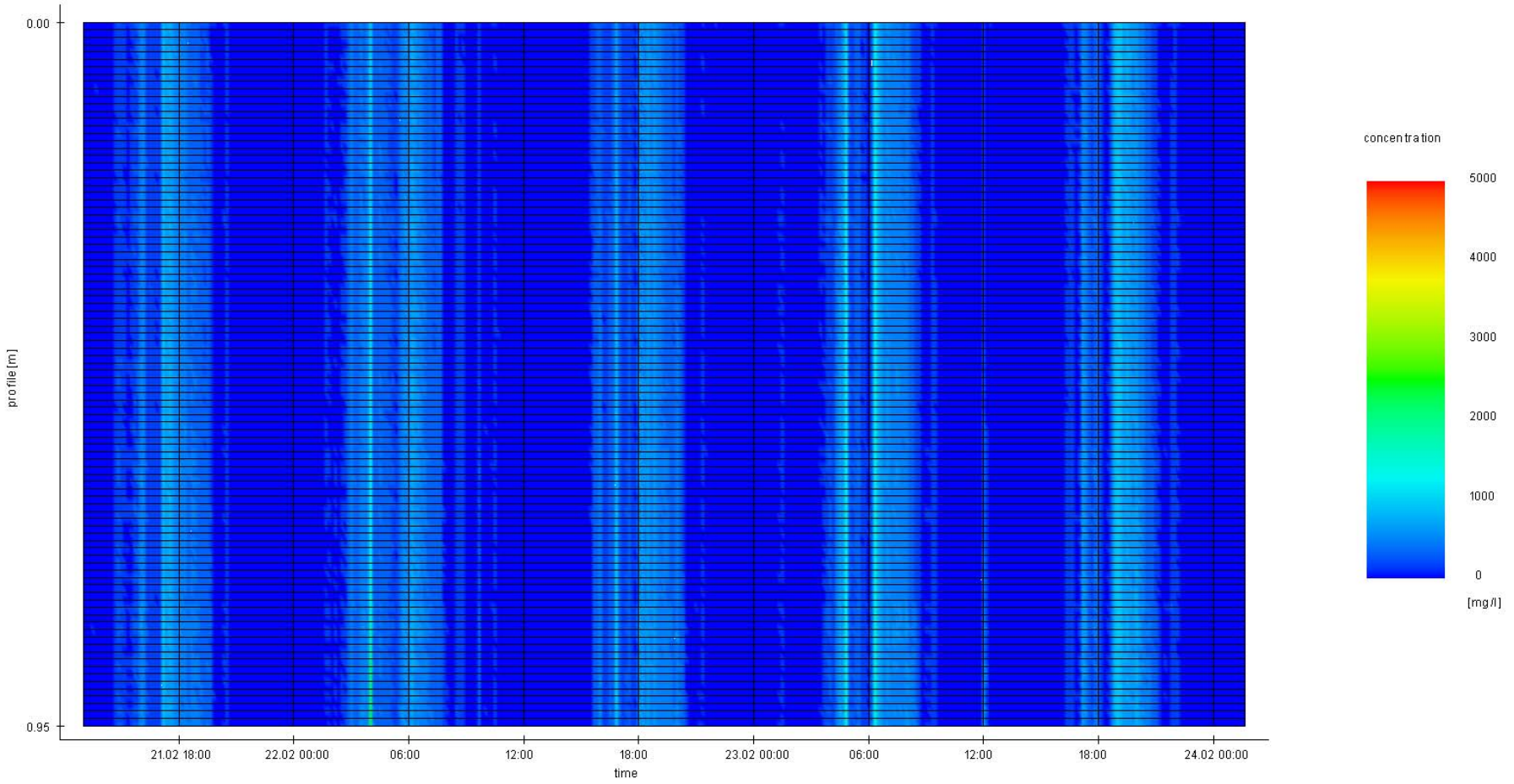
Date:
19/02/2007 – 21/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration
ARGUS ASM-IV

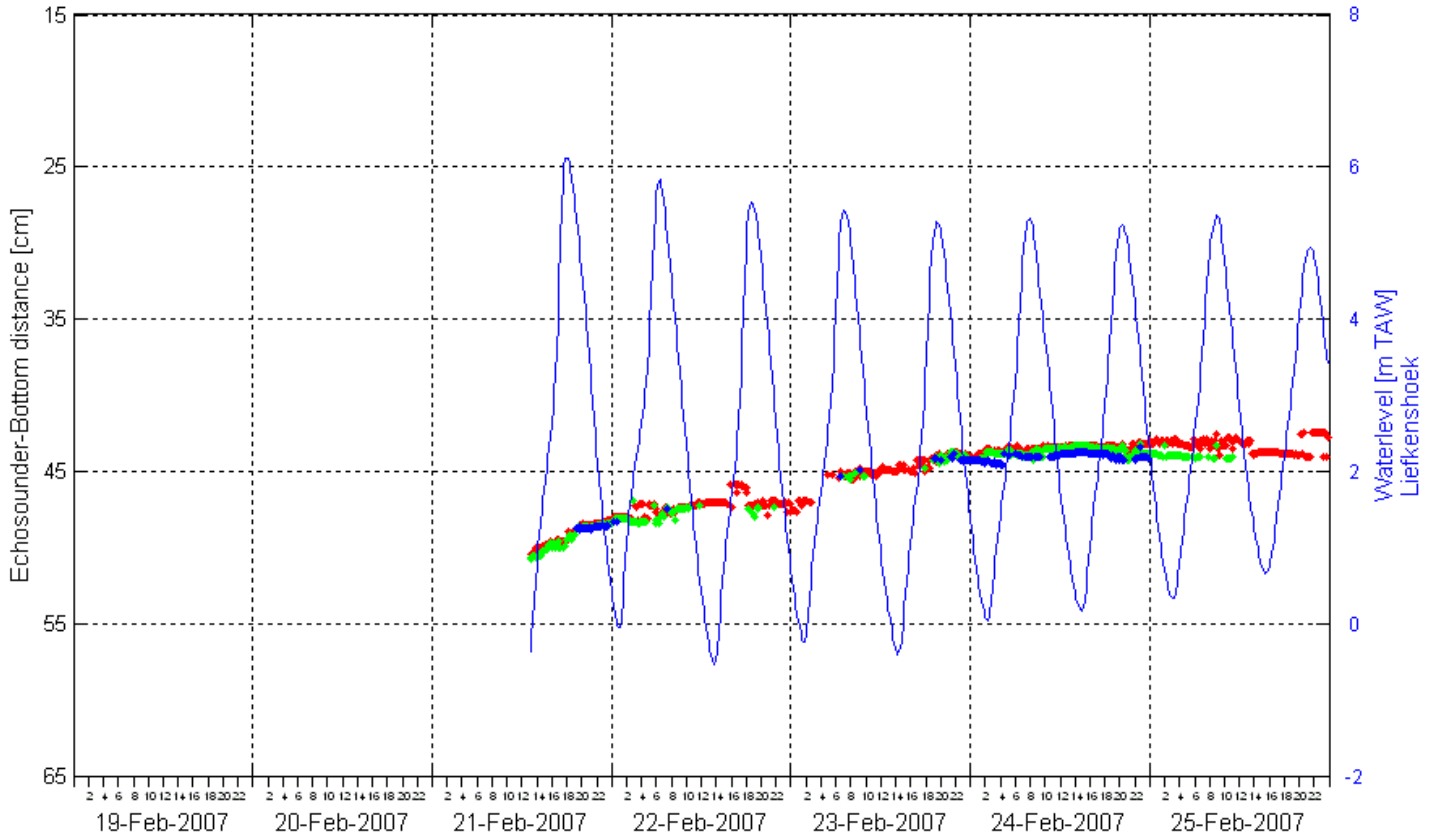
Location:	Date:
Deurganckdok Sill	21/02/2007 – 25/02/2007

Data processed by: IMDC

In association with: wl | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

Date:
21/02/2007 – 25/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

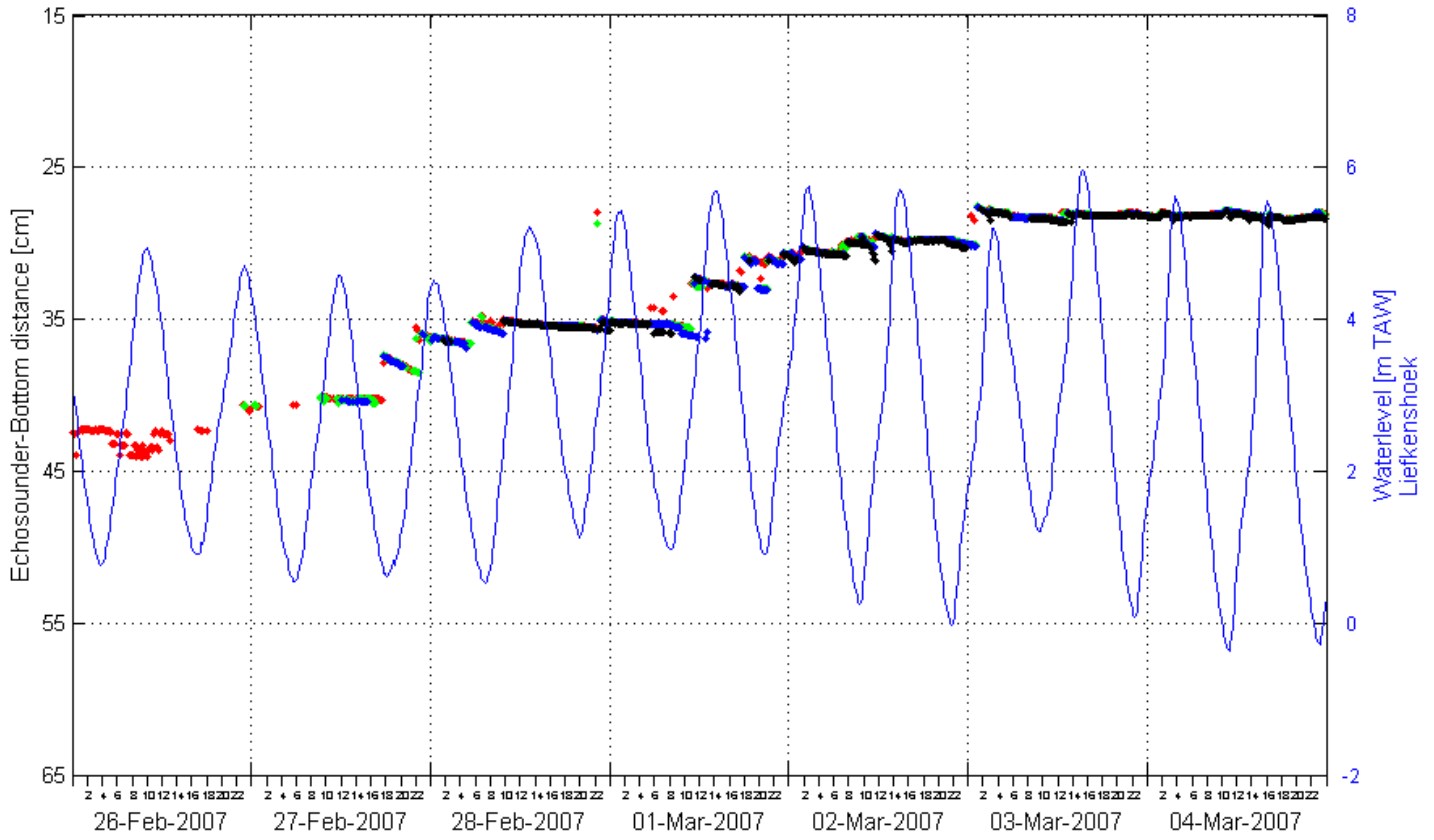
11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007

NO DATA

Time series suspended sediment concentration ARGUS ASM-IV		*Data processed by:* IMDC
Location: Deurganckdok Sill	Date: 26/02/2007 – 04/03/2007	*In association with:* WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

Date:
26/02/2007 – 04/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

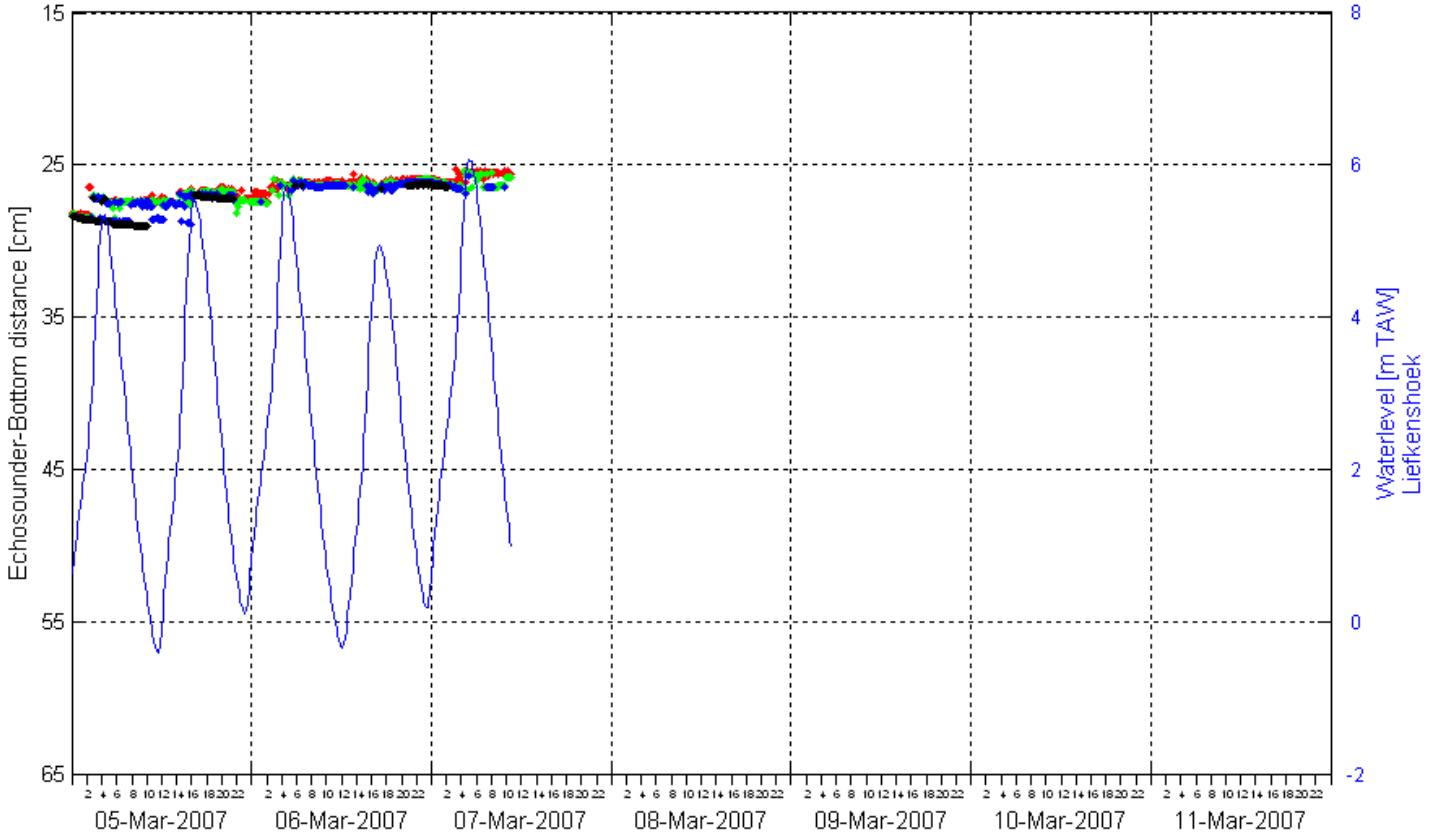
11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007

NO DATA

Time series suspended sediment concentration ARGUS ASM-IV		*Data processed by:* IMDC
Location: Deurganckdok Sill	Date: 05/03/2007 – 07/03/2007	*In association with:* WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

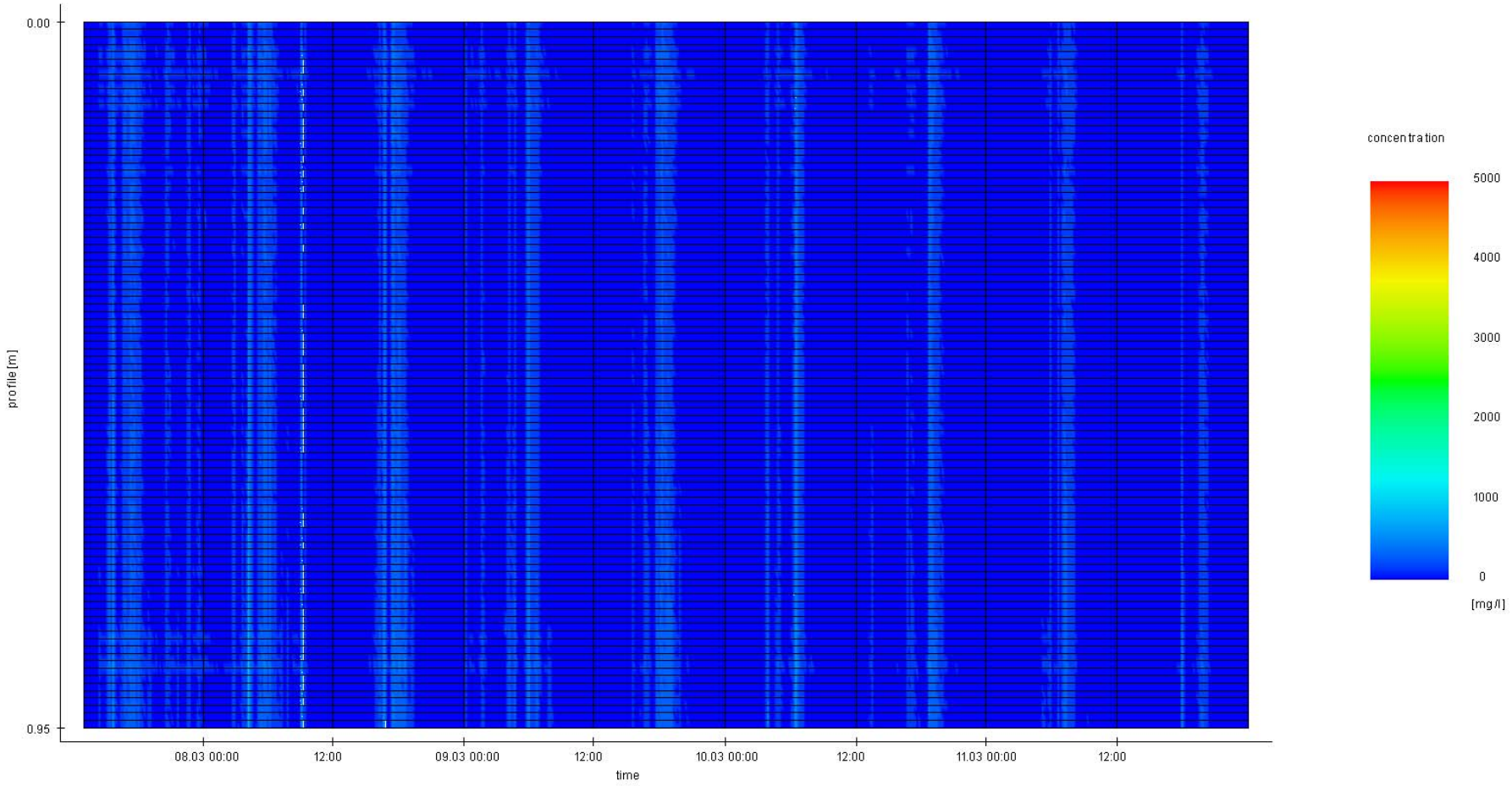
Date:
05/03/2007 – 07/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration
ARGUS ASM-IV

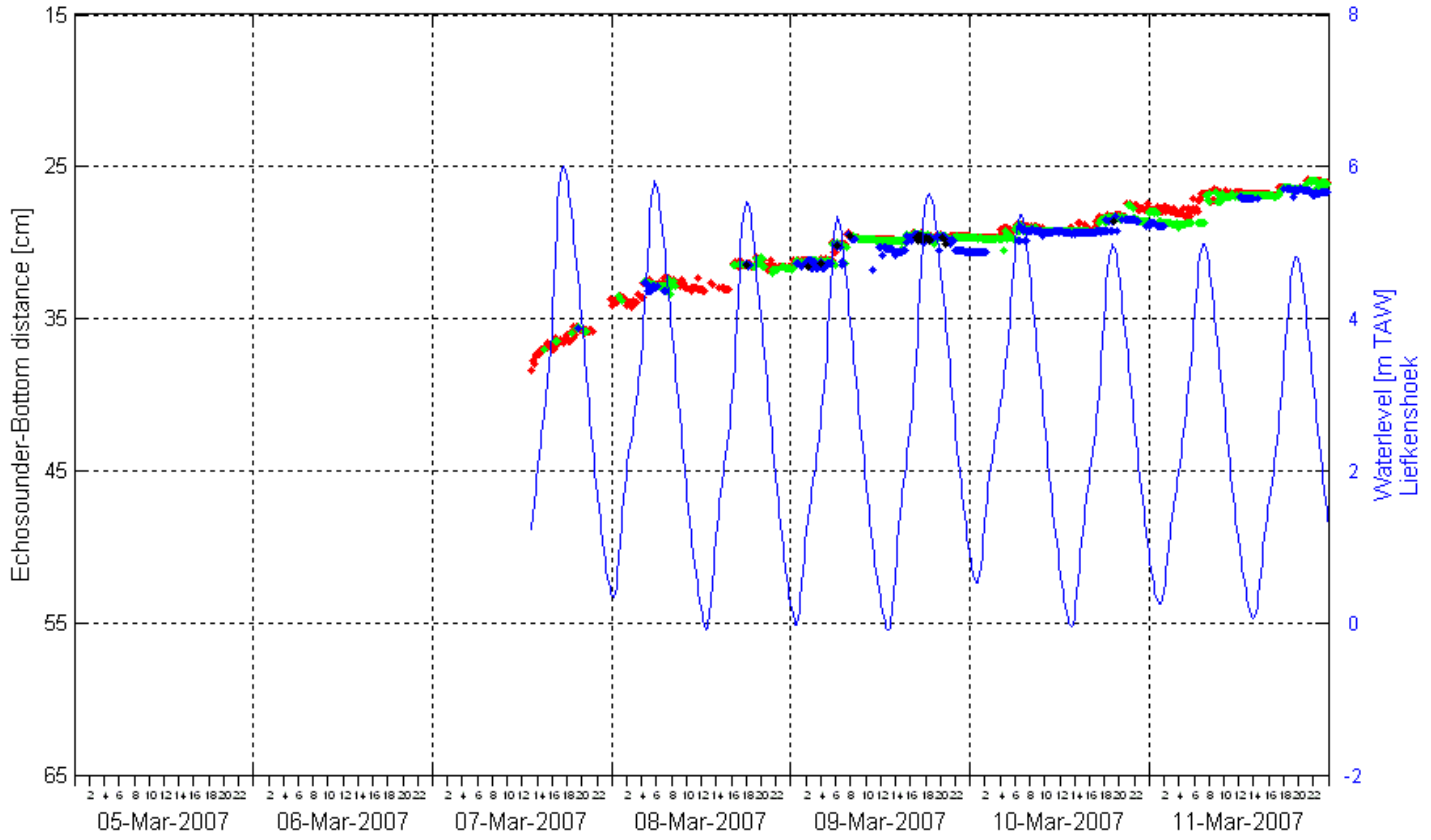
Location:	Date:
Deurganckdok Sill	07/03/2007 – 11/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

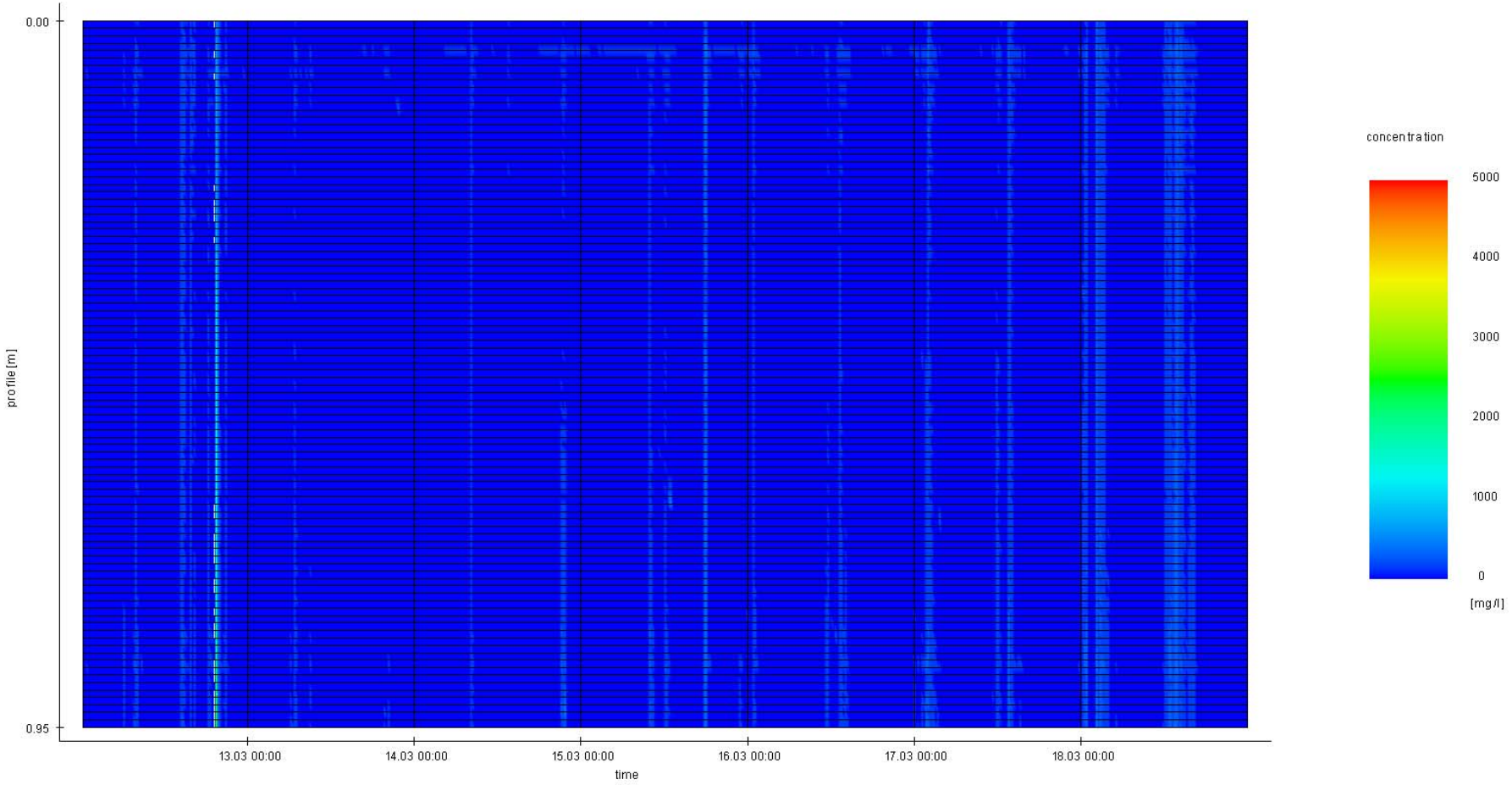
Date:
07/03/2007 – 11/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration
ARGUS ASM-IV

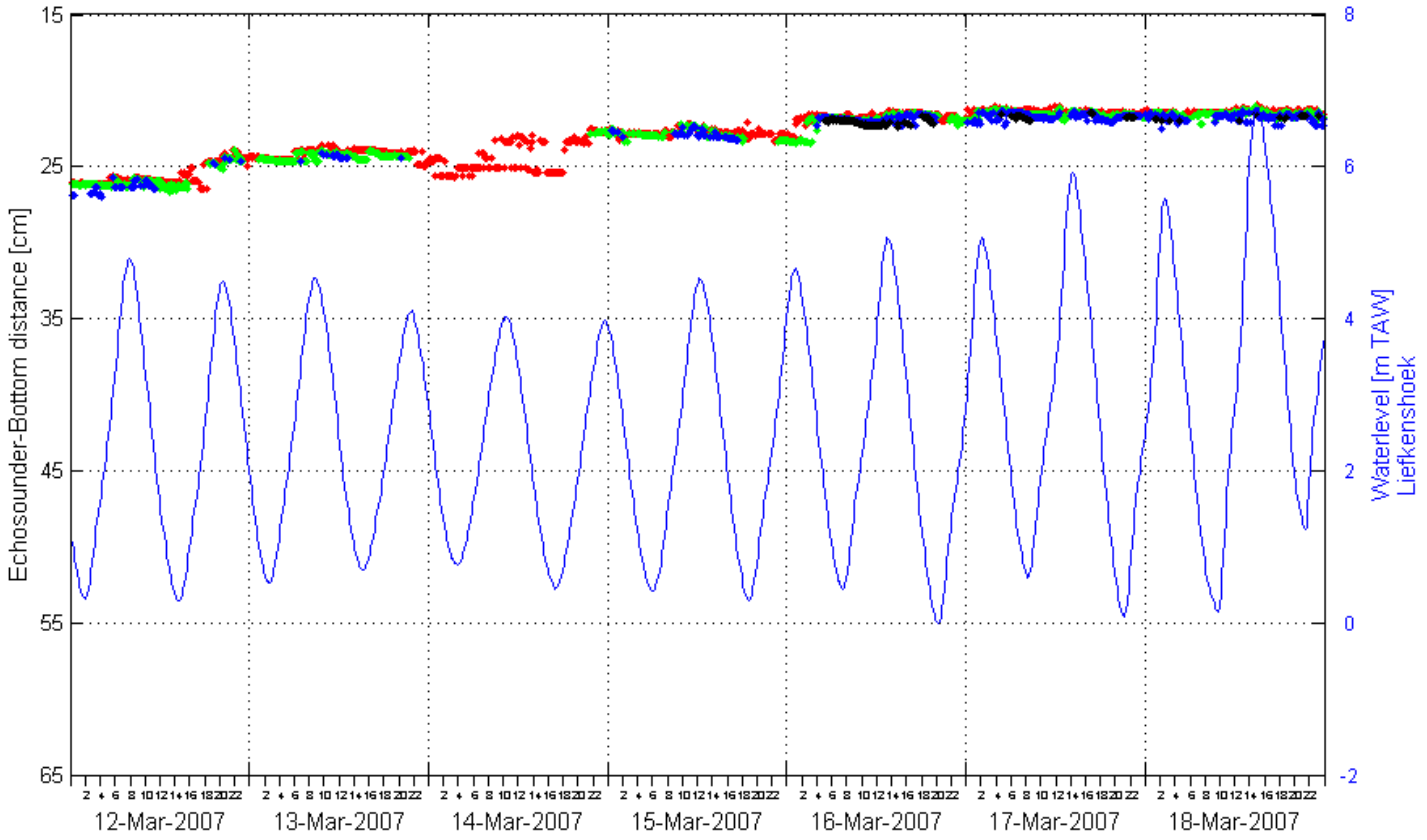
Location:	Date:
Deurganckdok Sill	12/03/2007 – 18/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

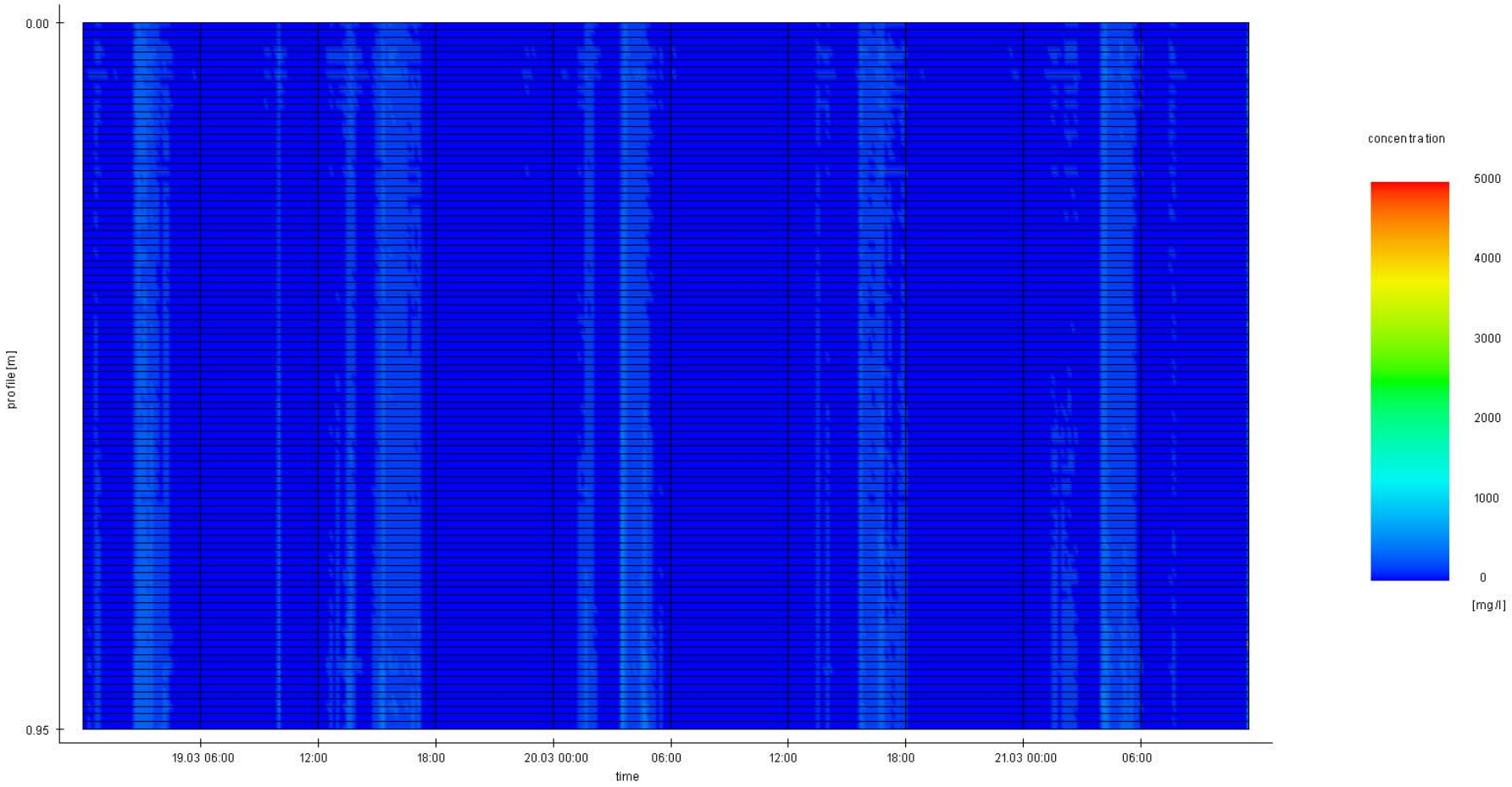
Date:
12/03/2007 – 18/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration
ARGUS ASM-IV

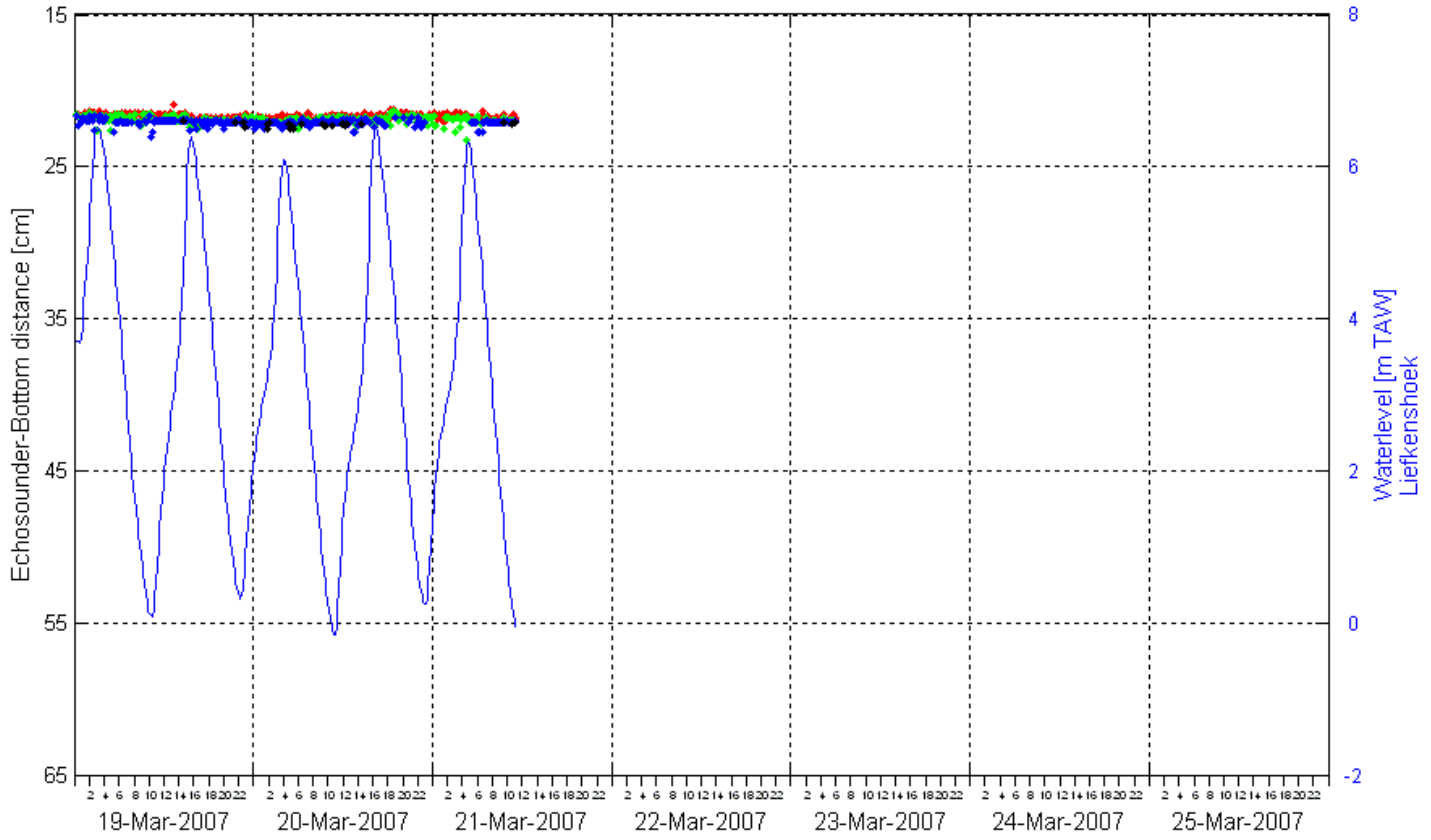
Location:	Date:
Deurganckdok Sill	19/03/2007 – 21/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

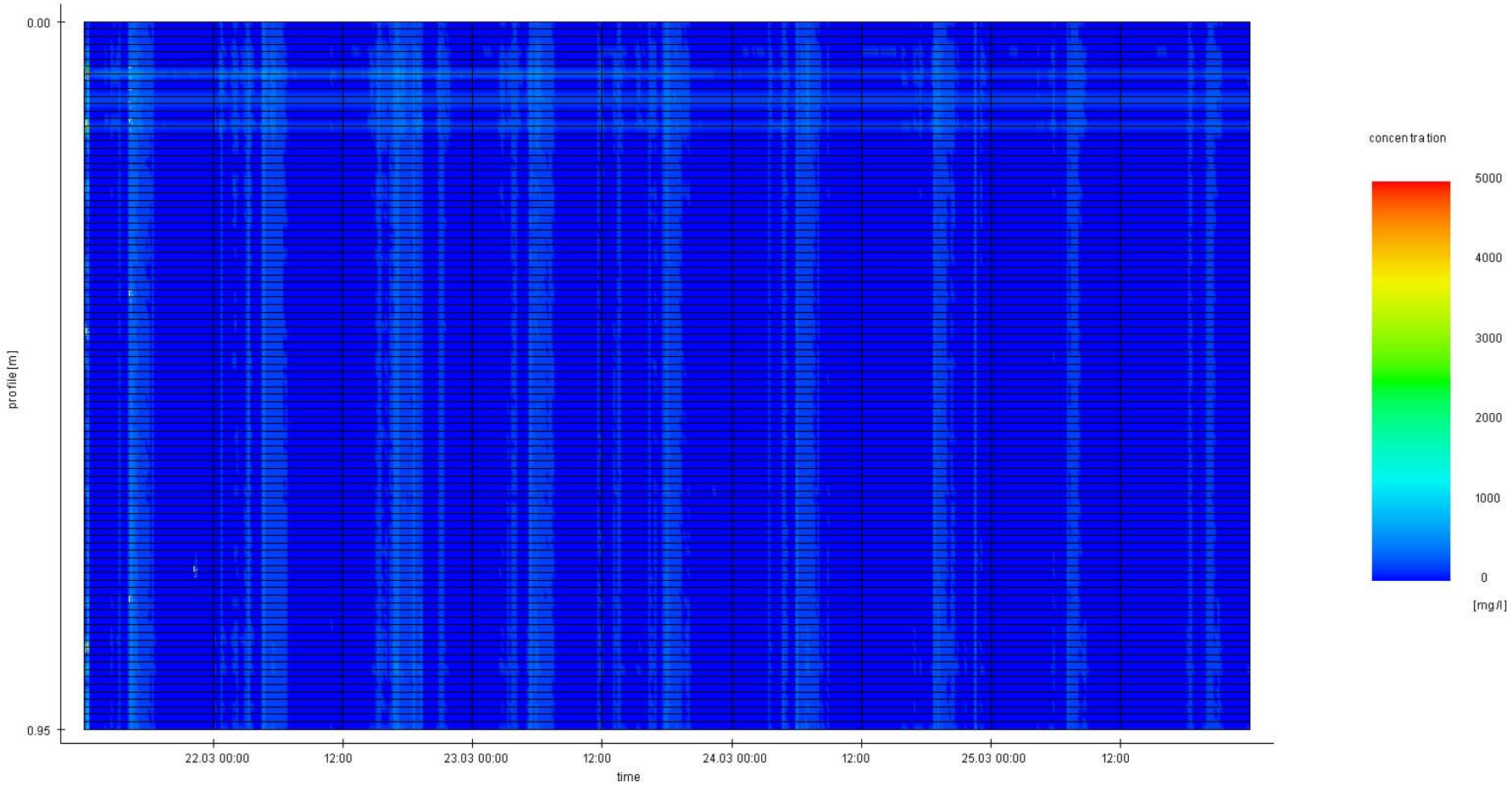
Date:
19/03/2007 – 21/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration
ARGUS ASM-IV

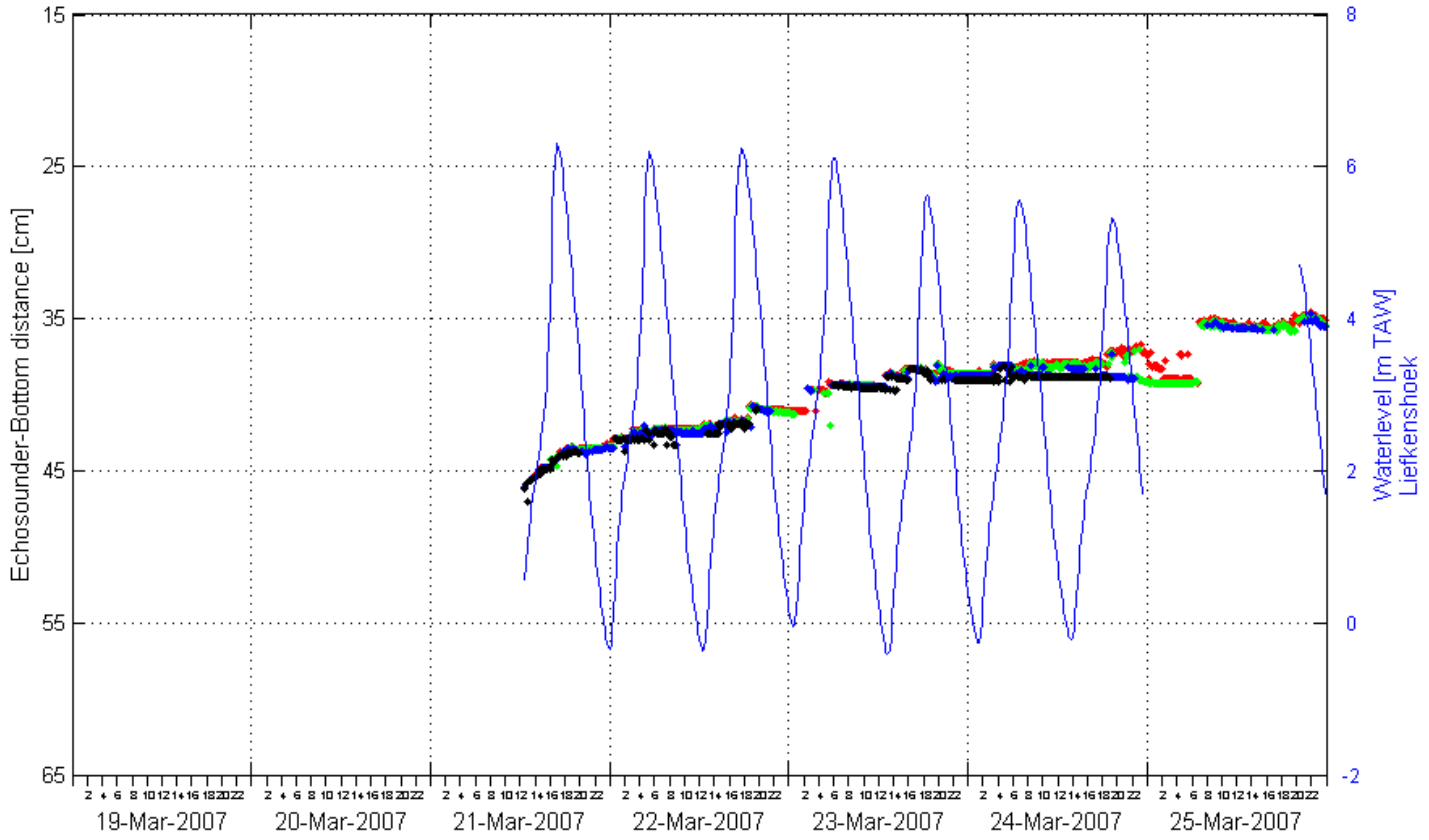
Location:	Date:
Deurganckdok Sill	21/03/2007 – 25/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

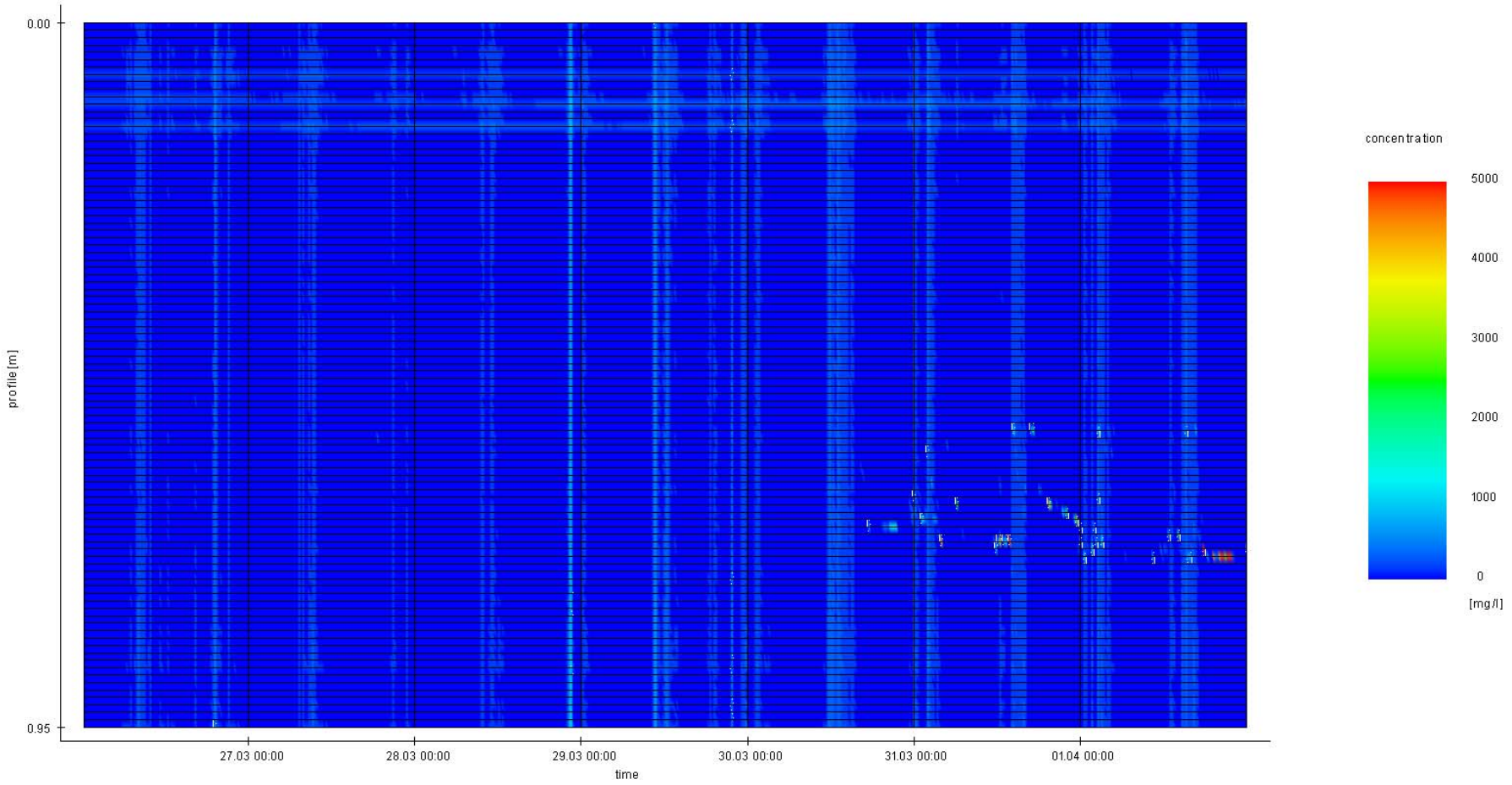
Date:
21/03/2007 – 25/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration
ARGUS ASM-IV

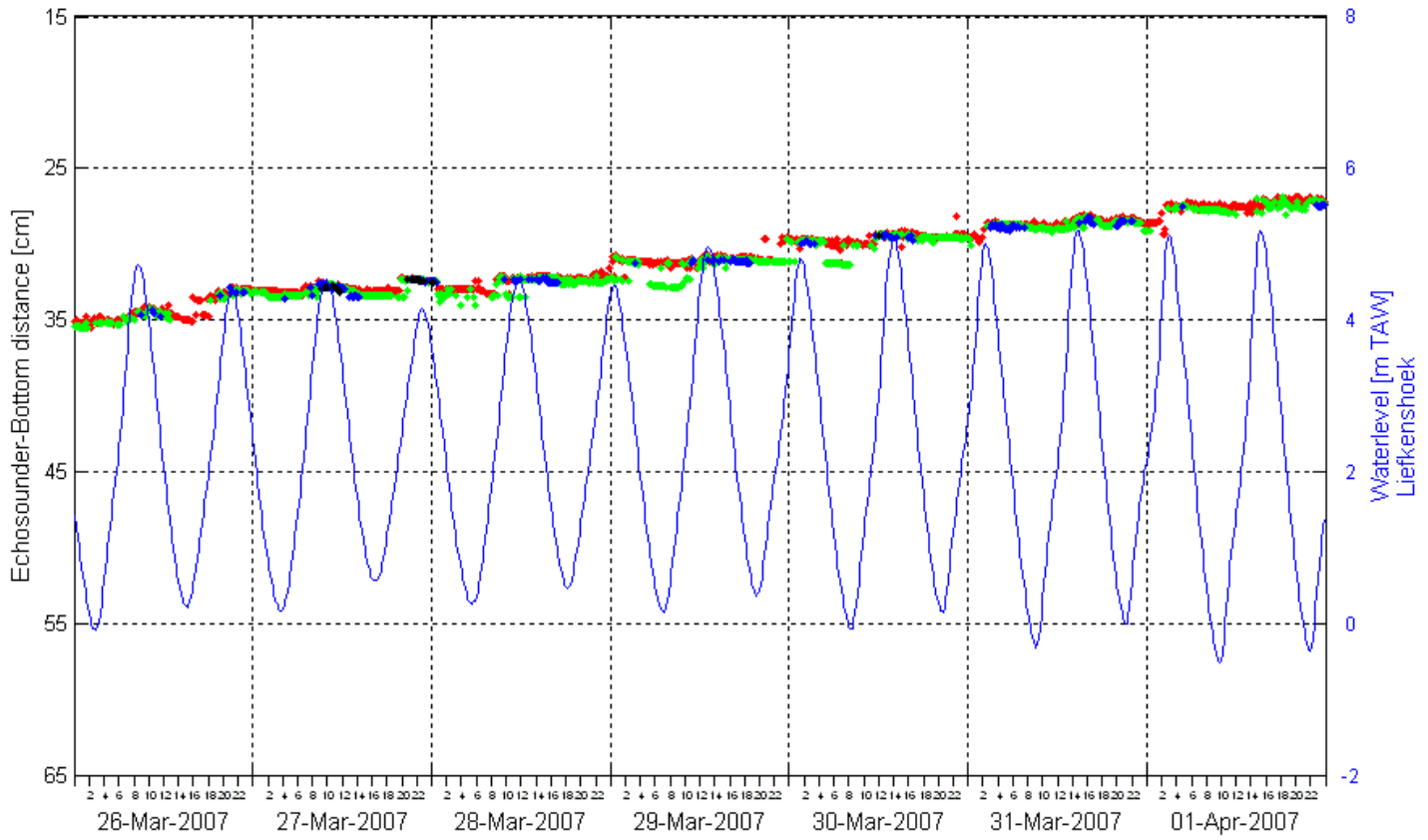
Location:	Date:
Deurganckdok Sill	26/03/2007 – 01/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

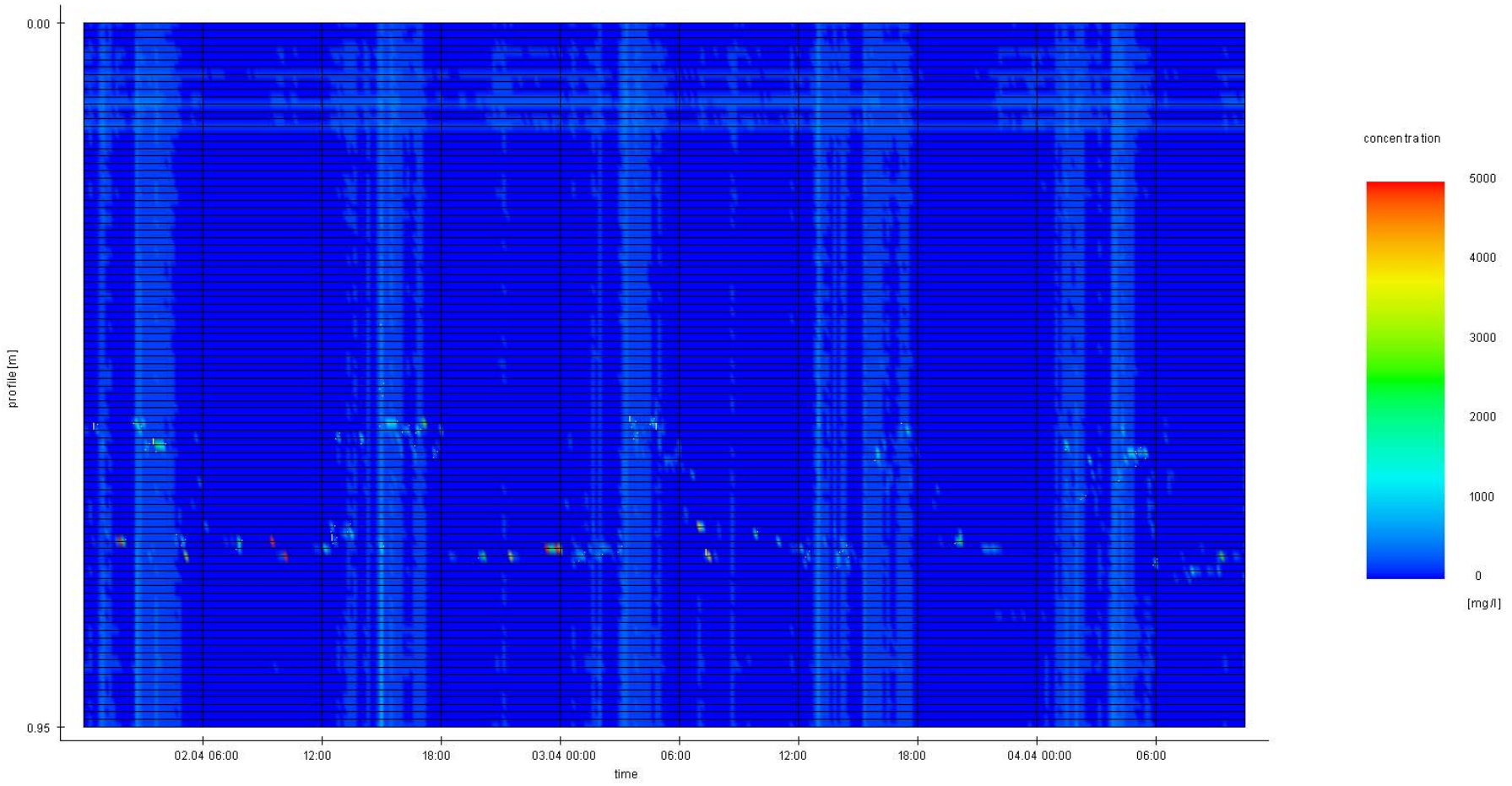
Date:
26/03/2007 – 01/04/2007

Data processed by: IMDC

In association with: wl | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration
ARGUS ASM-IV

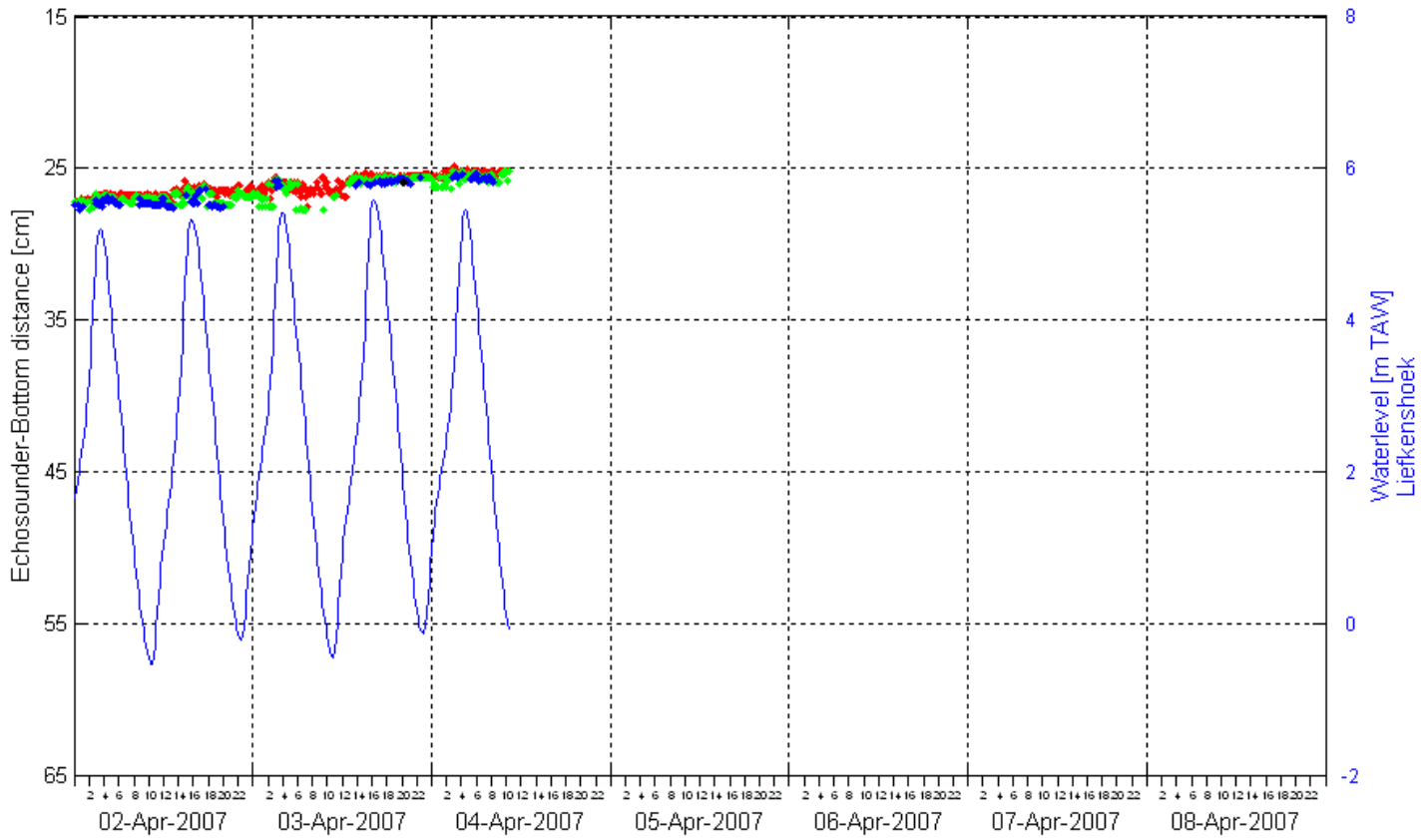
Location:	Date:
Deurganckdok Sill	02/04/2007 – 04/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

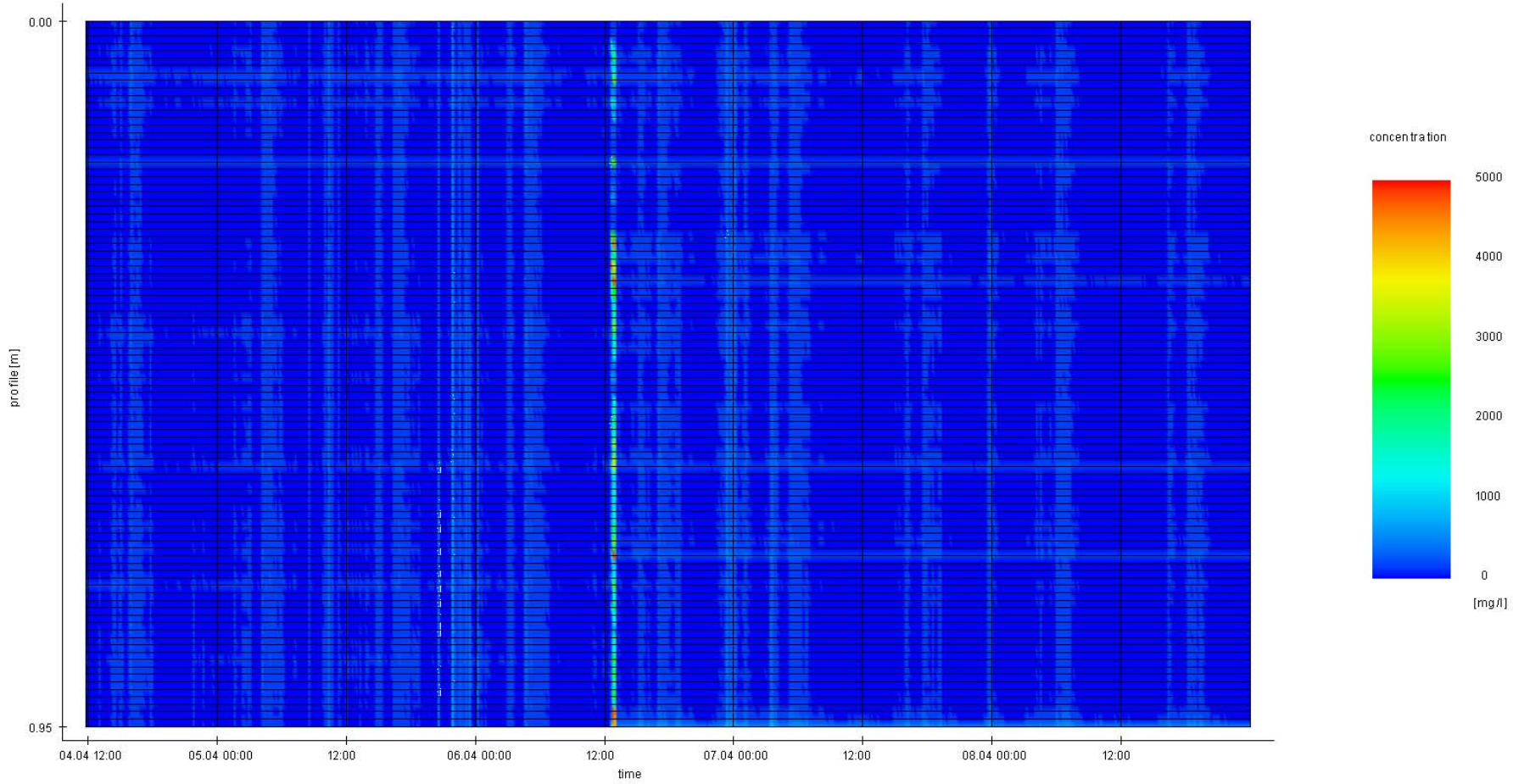
Date:
02/04/2007 – 04/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration
ARGUS ASM-IV

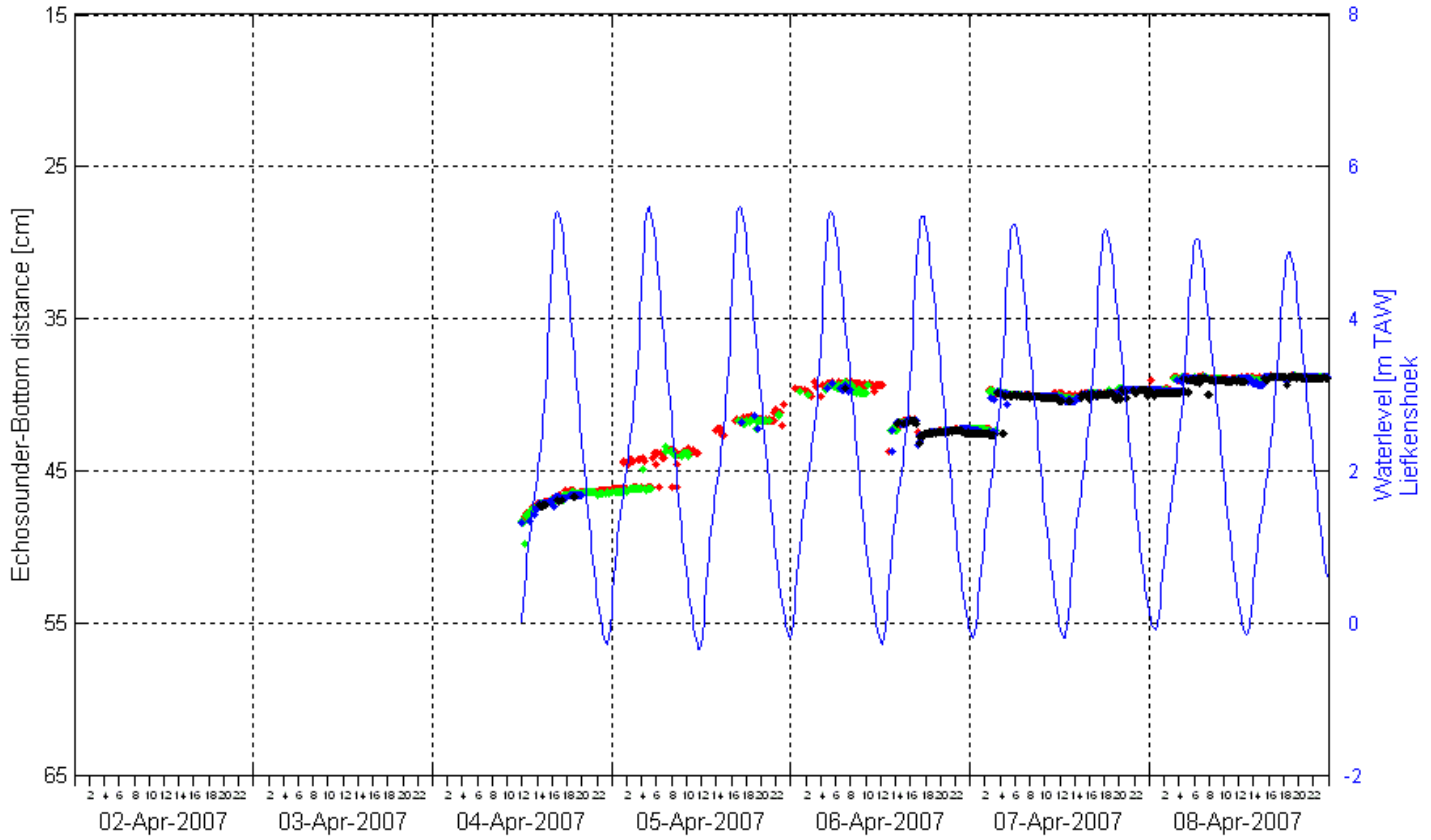
Location:	Date:
Deurganckdok Sill	04/04/2007 – 08/04/2007

Data processed by: IMDC

In association with: wl | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

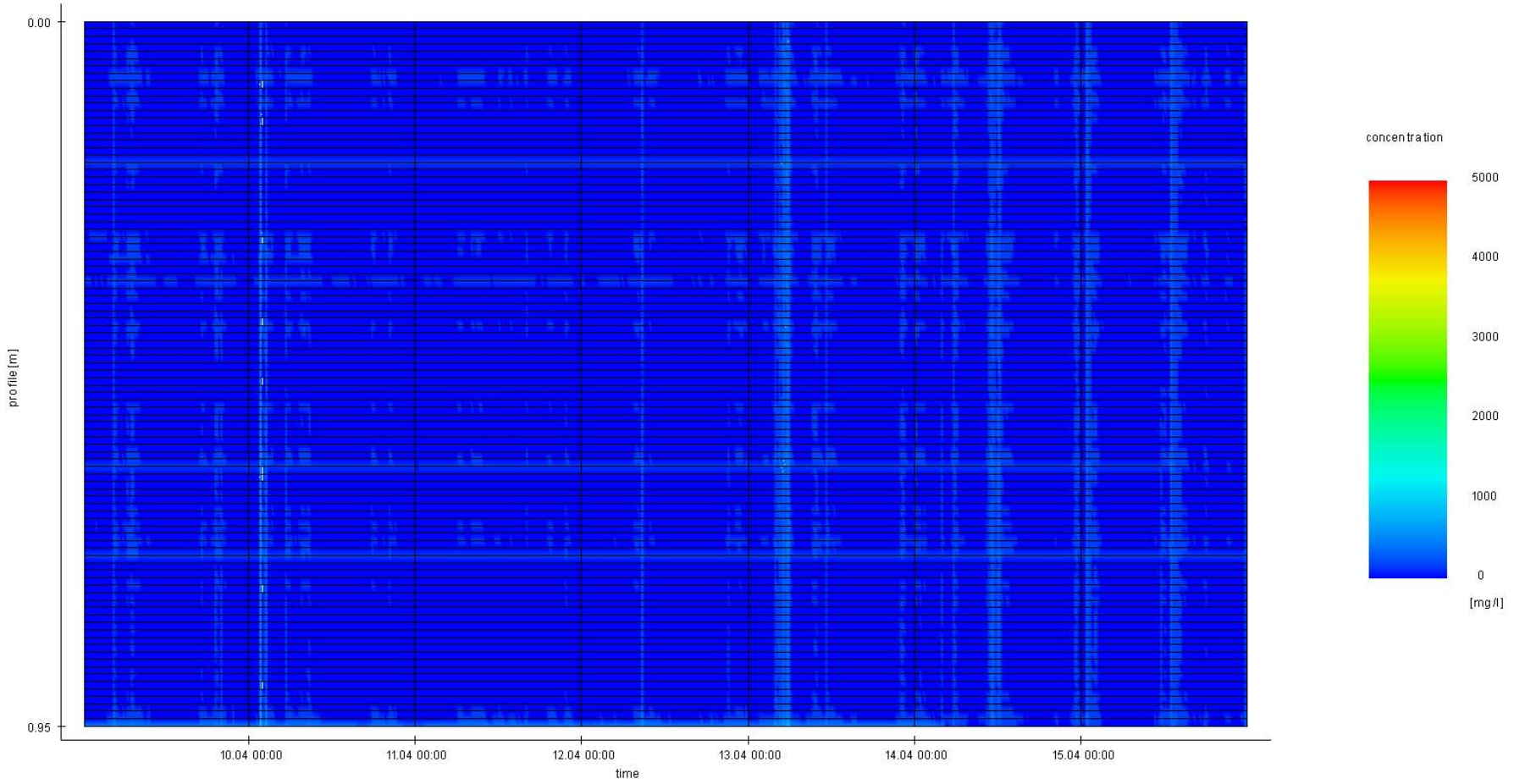
Date:
04/04/2007 – 08/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration
ARGUS ASM-IV

Location:
Deurganckdok Sill

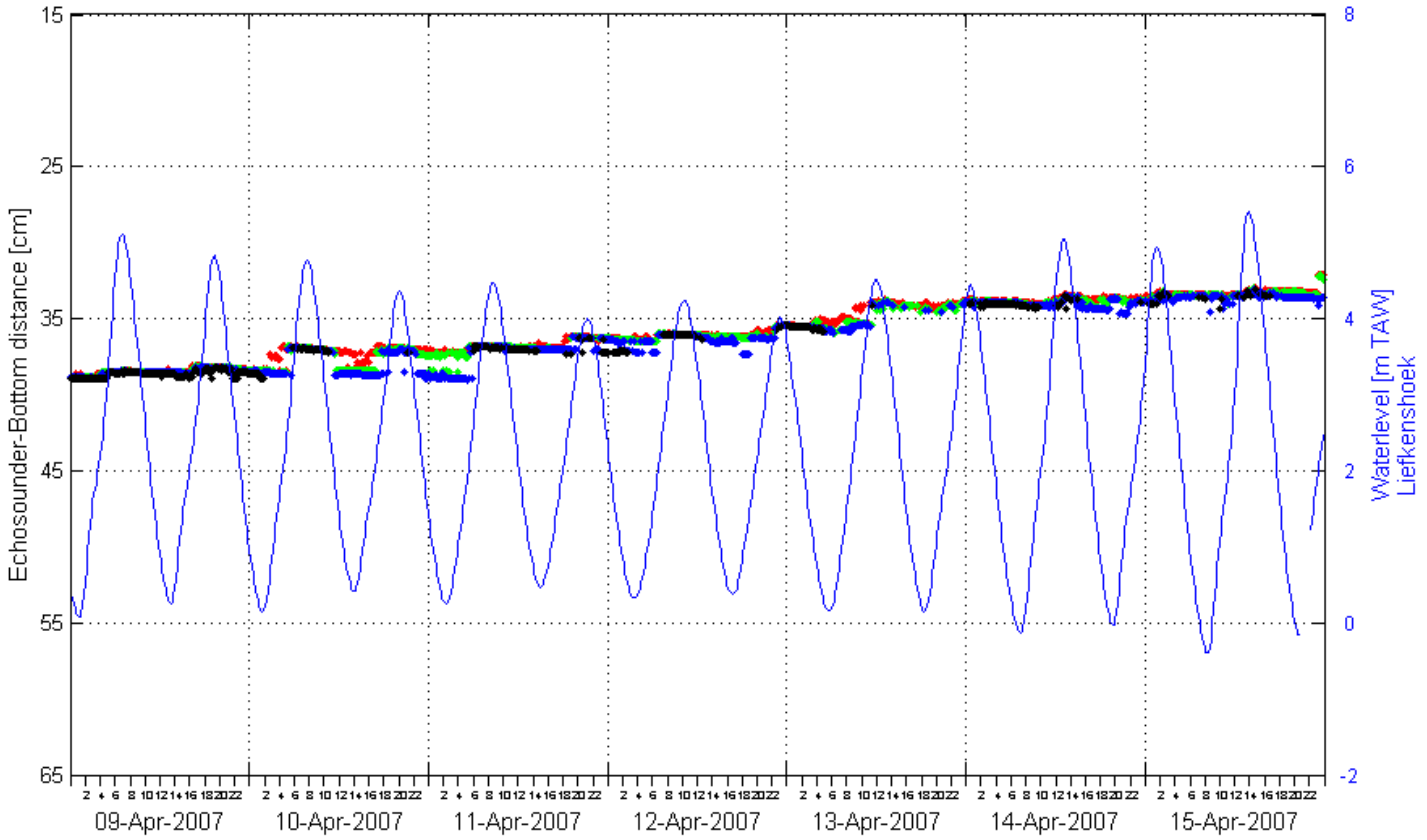
Date:
09/04/2007 – 15/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

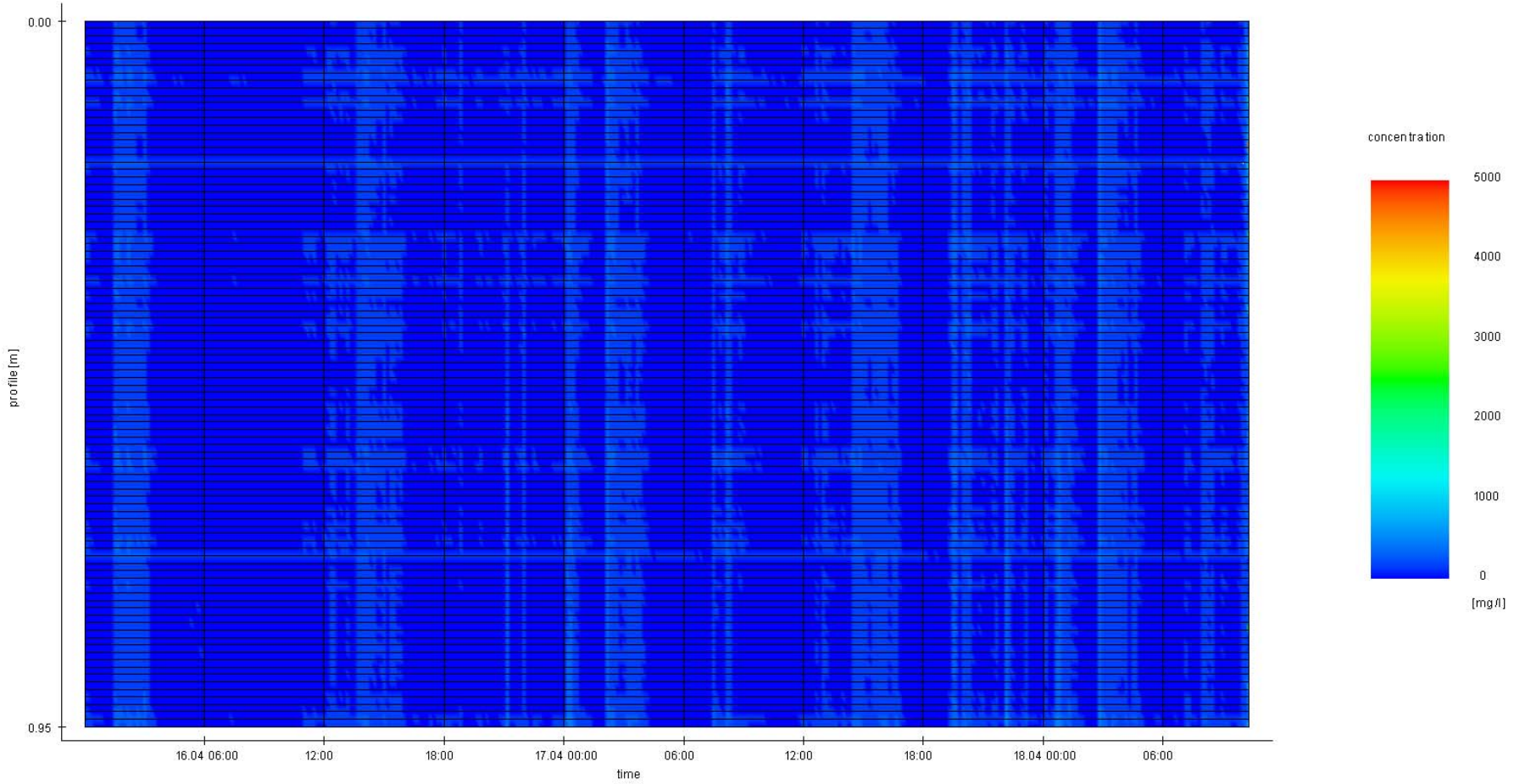
Date:
09/04/2007 – 15/04/2007

Data processed by: IMDC

In association with: wl | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration
ARGUS ASM-IV

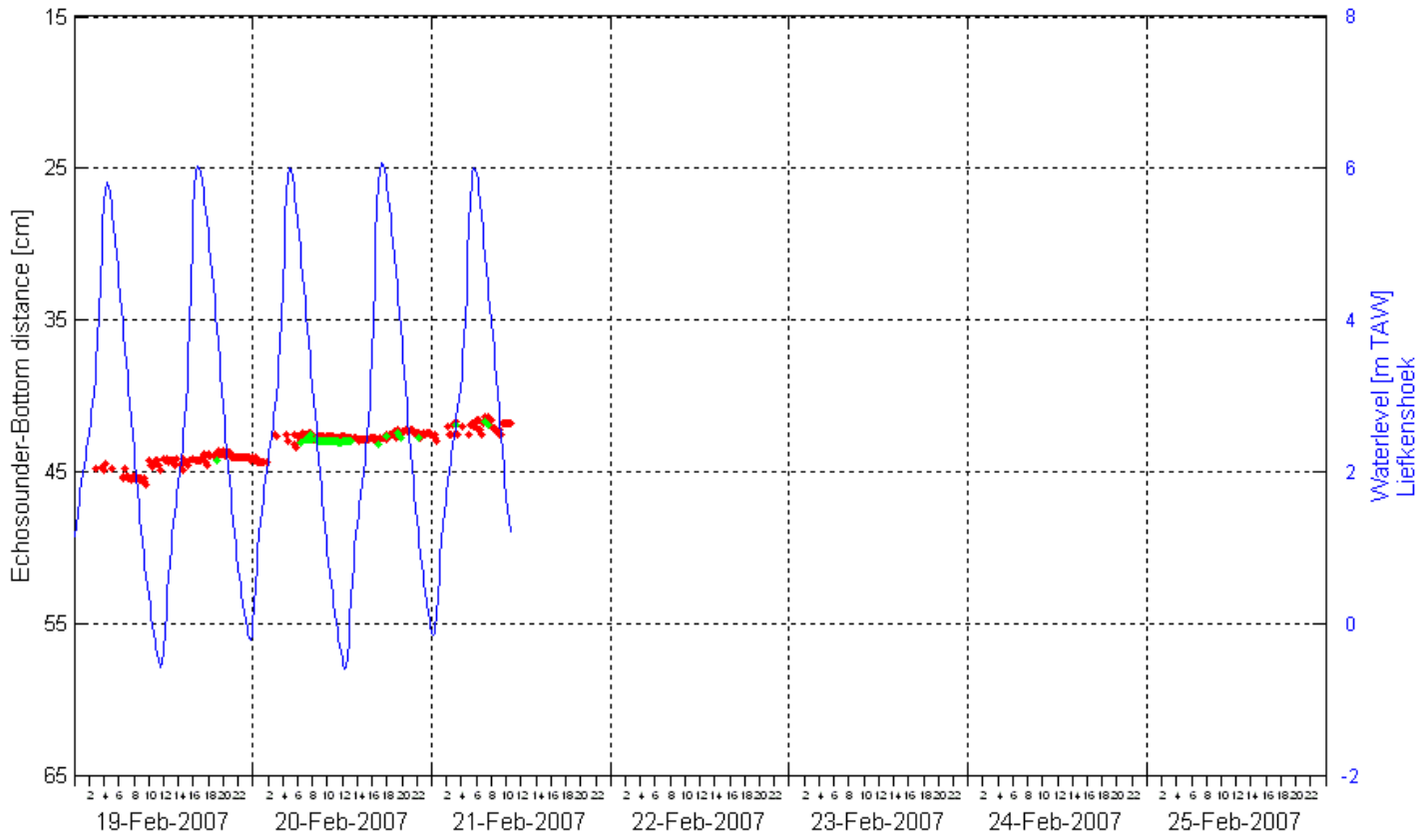
Location:	Date:
Deurganckdok Sill	16/04/2007 – 18/04/2007

Data processed by: IMDC

In association with: wl | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

Date:
16/04/2007 – 18/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

ARGUS Mean SS Concentration [mg/l] per tidal phase in layers of 10 cm (*except first column 6 cm) [distances given in cm above bottom]

Date	*Tide no.*	*Phase*	*Tidal diff [m]*	*115-110*	*109-100*	*99-90*	*89-80*	*79-70*	*69-60*	*59-50*	*49-404*	*39-30*	*29-20*
20070209	1	flood	0	204.2	177.4	330.9	464.8	362.9	295.7	364.4	431.6	401	370.9
20070210	1	ebb	11.4	90.4	81.7	94.8	121.9	111	97.9	109.4	120.7	119.7	123.4
20070210	2	flood	4.7	104.6	99.4	95.9	107.3	103.3	98.9	103.5	107	109.8	120.6
20070210	2	ebb	4.8	50.8	44.8	43.5	51.3	48.4	44.9	48.2	167.6	142.9	55
20070210	3	flood	4.6	142.3	136.8	133.6	143.7	140.9	135.2	139.3	143.4	145.3	155.1
20070222	3	ebb	4	183.7	178.1	177.8	188.4	186.5	188.2	193.4	194.8	198.7	205.3
20070222	4	flood	6	362.6	357.5	357.6	368.5	369.3	374.1	382.6	384.7	401.6	422.4
20070222	4	ebb	6.5	128.3	125.9	125.7	135.7	135.6	138	144.7	145.6	151	158.3
20070222	5	flood	6.2	281	279.9	281.1	289.9	290.3	294.4	301.4	304.8	310.3	315.4
20070223	5	ebb	5.9	137	133.7	134.1	143.5	143.7	144.1	151.3	152.6	160.4	167.8
20070223	6	flood	5.8	340	335.2	337.7	350.5	350.2	355.4	362.7	366.2	369.9	379.6
20070223	6	ebb	6	141.2	137.5	139	150.3	151.6	153.1	162.9	165.3	175.6	185.4
20070223	7	flood	5.8	291.7	284.9	280.3	287	285.5	288.5	292.7	291.2	295.1	293.1
20070224	7	ebb	5.2	158.1	153.4	153.7	162.3	161.6	164.1	170.4	172.4	180.9	184.7
20070307	8	flood	5	166.9	173.4	143.4	147	145.1	152	158.5	166.2	182.8	203.6
20070308	8	ebb	5.6	131	137.3	106.7	107.5	100.5	109.6	111.8	121	133.5	151.5
20070308	9	flood	5.5	150.7	157.4	124.3	122.8	117.7	125.9	131.9	139.2	156.7	179.4
20070308	9	ebb	5.8	92.5	97.7	69.7	69	67	72.4	74.7	80.2	91.5	108.1
20070308	10	flood	5.6	138.3	145.8	115.7	115.8	113.5	121.7	126.9	134.7	147.4	168.4
20070309	10	ebb	5.5	86.3	91.8	63.2	61.4	57.5	64.3	68.2	75.4	85.4	98
20070309	11	flood	5.3	128.5	137.8	110.1	109.8	106.4	116.7	121	130.8	145.3	158.5
20070309	11	ebb	5.4	58.8	65	40.3	38.4	36.5	40.6	40.9	46	52.7	65
20070309	12	flood	5.8	109.8	118.4	88.5	87.2	83.3	89.7	93.2	99.4	109.7	126.1
20070310	12	ebb	5.1	61.2	69.2	45.7	44	41.5	47.2	48.6	54	62.2	74.4
20070310	13	flood	4.9	108.7	115.7	87.4	87.7	86	92.7	98	105.5	117.1	135.2

ARGUS Mean SS Concentration [mg/l] per tidal phase in layers of 10 cm (*except first column 6 cm) [distances given in cm above bottom]

Date	*Tide no.*	*Phase*	*Tidal diff [m]*	*115-110*	*109-100*	*99-90*	*89-80*	*79-70*	*69-60*	*59-50*	*49-404*	*39-30*	*29-20*
20070310	13	ebb	5.4	46.8	51.7	28.3	26.7	24.8	28.9	30.3	34.8	39.8	48.2
20070310	14	flood	5	99.5	105.4	77.9	75.3	73.1	79.5	81.6	88	97.4	112.8
20070311	14	ebb	4.7	57.5	63	39.5	37.9	36	39.3	40.5	44.9	50.5	61
20070311	15	flood	4.7	74.8	78.9	55.9	56	54.7	59.2	63.5	70.2	78.3	92.6
20070311	15	ebb	4.9	36.6	44.3	22.1	20.2	18.8	21.9	22.9	26.1	30.5	39.4
20070311	16	flood	4.7	45.8	55.9	34.1	33.6	34	38.3	40.9	45.9	56.1	71.3
20070312	16	ebb	4.5	44.3	52	28.7	27.1	26.4	30.1	31.9	35.3	42.1	51.6
20070312	17	flood	4.5	50.9	58.4	30.4	28	25.4	31.1	31.6	37.2	44.6	59.3
20070312	17	ebb	4.5	39.2	46.1	24.8	22.4	21.3	24.2	24.5	27.6	30.9	37.6
20070312	18	flood	4.2	131.5	138.1	111.3	114.2	116.4	125.9	131.3	144	161.3	189.1
20070313	18	ebb	4	42.9	47.6	22.2	17.8	16.2	19	19.4	22	26.4	33.3
20070313	19	flood	4	56.5	57.9	32.2	29	26.5	31.4	31.5	36.5	42.7	54.9
20070313	19	ebb	3.9	33.1	32.5	11.2	8.4	7.5	9.9	10	12.1	14.1	22.7
20070313	20	flood	3.5	44.7	40.2	12.1	8.5	6.7	9	9.5	12.4	14.3	24.9
20070314	20	ebb	3.3	34.3	19	2.8	0.6	0.2	0.8	0.4	0.7	1.2	6.6
20070314	21	flood	3.3	60.4	42.4	23.3	19.4	18.6	19.9	20.9	23.8	27.4	36.4
20070314	21	ebb	3.6	42.2	24	7.8	3.5	2.8	3.1	2.9	3.4	4.4	10.4
20070314	22	flood	3.5	59.5	37.9	17.6	14.2	14.1	17.4	18.7	22.7	28	43.1
20070315	22	ebb	3.6	43.9	20.8	4.3	0.6	0.3	0.5	0.3	0.6	1.8	7.2
20070315	23	flood	4.1	87.7	63.8	42	35.1	33.6	38.5	41.5	46.3	54.4	68.4
20070315	23	ebb	4.2	84.5	65.3	46.5	43.3	43.2	46.3	53.3	50	51.6	62.6
20070316	24	flood	4.4	90.4	65.2	39.9	32.7	31.1	35.3	37.7	43.7	52.9	66.6
20070316	24	ebb	4.2	48.3	33	13.9	9.3	8.5	10.8	11.5	13.9	17	26.5
20070316	25	flood	4.6	71.4	52	32.3	27.9	27.8	31.9	33.3	39.3	48.5	54.7
20070316	25	ebb	5.1	53.3	33.9	15.5	11.7	10.9	13.1	13.7	17.3	20.6	31.8

ARGUS Mean SS Concentration [mg/l] per tidal phase in layers of 10 cm (*except first column 6 cm) [distances given in cm above bottom]

Date	*Tide no.*	*Phase*	*Tidal diff [m]*	*115-110*	*109-100*	*99-90*	*89-80*	*79-70*	*69-60*	*59-50*	*49-404*	*39-30*	*29-20*
20070317	26	flood	5	89.6	65.8	45.2	43	43.2	48.1	50.5	57.4	63.3	84
20070317	26	ebb	4.4	56.8	40.5	21.7	18.2	17.6	20.3	21.6	27	29.2	41.1
20070317	27	flood	5.3	86.8	66.5	46.6	43.4	43.3	47.8	50.1	57.7	64.2	82.4
20070317	27	ebb	5.9	53.1	35.7	18.2	15.9	14.9	17.9	19.4	23.2	25.8	35.5
20070318	28	flood	5.4	103.4	88.5	66.2	63.3	63.8	67.8	70	77.1	82.2	97
20070318	28	ebb	5.5	66.9	56.7	37.5	33.5	32.6	36.1	37.4	42.4	46.4	56.9
20070318	29	flood	6.6	179.1	171.5	146.9	144.3	145.1	156	155.1	164.8	176	196.7
20070318	29	ebb	5.6	64	56.1	36.3	32.5	31.5	34.6	36	40.6	41.4	48.3
20070319	30	flood	5.2	98.6	90.1	68.3	63.9	62.5	66.8	69.5	75.8	80.4	90.6
20070319	30	ebb	6.4	80.6	72.9	52	48.3	47.9	52.1	54.2	61.2	65.5	77.4
20070319	31	flood	6.3	127.3	117.3	92.5	89.4	88.8	94.9	100	108.9	115.4	131.3
20070319	31	ebb	6	79.4	76.4	53.3	49.3	48	51.7	54	60.4	64.1	74.7
20070320	32	flood	5.8	111.4	106.1	82.4	78.7	78.7	84.1	87.6	98.1	102.8	115.2
20070320	32	ebb	6.2	60.1	56.5	37.6	35	34.4	39.5	42.4	47.5	51	60.1
20070320	33	flood	6.7	85.6	80	58.4	53.6	52.5	56.2	58.2	63.9	66.6	76.4
20070320	33	ebb	6.3	73.5	71.5	50.6	46.7	45.7	49.1	50.7	57.9	60.3	69.5
20070321	34	flood	6.1	119.2	115.1	89.6	86.4	84.6	90.5	93.2	99.3	105.4	119.3
20070321	34	ebb	17.7	86.7	98.2	59.8	55.7	57.6	59.1	60	65.8	80.5	88
20070321	35	flood	16.9	159.8	363.2	156	126.9	131.8	127	132.5	136.1	188.2	189.4
20070321	35	ebb	6.6	82.7	194.8	63.1	51.2	49.5	52	50.7	58.7	68.4	69.1
20070322	36	flood	6.5	159.2	272.6	140.6	126.8	125.7	130.2	130	137.9	151.8	155.2
20070322	36	ebb	6.6	80.5	191.2	61.3	51	49.6	53.1	52.1	57.4	61.5	72.5
20070322	37	flood	6.6	165.2	270.7	138.4	126.5	125	128.9	129.3	135.1	142.3	153.5
20070323	37	ebb	6.3	133	241.6	113.1	101.9	100.2	104.6	103.1	109.5	116	126.3
20070323	38	flood	6.1	143.7	250	118.8	106.9	104.7	109.8	108.8	118.2	124.3	135.8

ARGUS Mean SS Concentration [mg/l] per tidal phase in layers of 10 cm (*except first column 6 cm) [distances given in cm above bottom]

Date	*Tide no.*	*Phase*	*Tidal diff [m]*	*115-110*	*109-100*	*99-90*	*89-80*	*79-70*	*69-60*	*59-50*	*49-404*	*39-30*	*29-20*
20070323	38	ebb	6.5	99	204.1	75.6	65.6	66.2	70	69.6	76.7	82.7	93.2
20070323	39	flood	6.1	146.3	245.8	122.7	109.3	109.2	113.1	112.6	121.7	129	140.5
20070324	39	ebb	5.9	74.7	168.4	50.6	43.1	42.4	44.1	44.5	47	51.9	60.2
20070324	40	flood	5.8	124.8	213.5	99.9	89.9	89.5	92.7	93.3	100	107.1	119.4
20070324	40	ebb	5.8	81.8	161.5	53.4	44.9	44.4	47.1	46.2	51.4	55.9	65.7
20070324	41	flood	5.5	120.4	202.5	89.7	79.8	78.1	81.2	80.8	87.7	93.1	102
20070325	41	ebb	5.4	94.6	180.1	72.1	61.5	60.6	64.8	64	71.3	76.8	86.5
20070325	42	flood	5.3	94.5	181.4	69.4	60.4	59.4	63	63.2	69	73.7	83.5
20070325	42	ebb	5.3	52.6	139.5	33	26.5	25.8	28	27.6	31.9	36.6	45
20070325	43	flood	4.8	74.8	159.5	49.7	42.2	41	44.6	45.2	50.6	55.7	64.9
20070326	43	ebb	4.8	59.1	146.2	39.1	29.5	28.1	30.5	29.7	34.2	39.5	47.2
20070326	44	flood	4.8	93.9	182.1	71.4	62.1	60.8	65.5	65.8	72.4	79.1	90.9
20070326	44	ebb	4.6	87.1	174.6	67	57.9	58.4	62	61.1	70.7	74.9	84.7
20070326	45	flood	4.2	126.7	214.4	103.4	92.6	91.8	96	96.9	104.3	112.4	124.1
20070327	45	ebb	4.2	44.6	129.9	24	16.8	15.2	17.1	16.5	20	22.3	29.1
20070327	46	flood	4.4	126.1	213.5	100	89.1	86.4	91.4	91.2	97.7	104.7	115.1
20070327	46	ebb	4	49.9	139.9	29.2	20.5	19.1	22.1	21.8	25.4	29.8	37.4
20070327	47	flood	3.6	76.9	172.8	53.2	40.9	38.8	42.7	42.5	48.5	52.7	60.2
20070328	47	ebb	3.9	38.5	129.8	17.3	10.9	9.9	11.6	11.6	14	17.1	22.4
20070328	48	flood	4.3	104.3	203.4	77.7	65.8	64.2	67.3	66.9	71.5	77.3	84.8
20070328	48	ebb	4.1	54.6	151.9	30.3	21.2	20.3	22.8	22.6	25.9	31.3	38.6
20070329	49	flood	4	120.1	220.1	94.9	86.3	85	89.1	90.5	95.2	102.8	113.7
20070329	49	ebb	4.3	46.3	145	24.3	15.6	14.8	17.2	17.9	20.9	24.6	30.6
20070329	50	flood	4.8	158.6	258.9	134.4	125.3	124.9	127.6	130.2	135.3	144.8	157
20070329	50	ebb	4.6	85	183.6	66.9	56.6	55.9	59.2	57.9	63	67.7	74.5

ARGUS Mean SS Concentration [mg/l] per tidal phase in layers of 10 cm (*except first column 6 cm) [distances given in cm above bottom]

Date	*Tide no.*	*Phase*	*Tidal diff [m]*	*115-110*	*109-100*	*99-90*	*89-80*	*79-70*	*69-60*	*59-50*	*49-404*	*39-30*	*29-20*
20070330	51	flood	4.4	135.8	237.6	114.1	100.5	98.1	103.3	103.7	111.2	120.6	129.5
20070330	51	ebb	4.9	60.9	156	40.2	28.4	27.7	28.5	28.9	33.1	38.4	43.8
20070330	52	flood	5.2	169.2	262.4	145.9	136	136	140	140	146.3	157.8	170.5
20070330	52	ebb	4.9	73.7	165.7	52.5	39.6	37.9	38.2	41.4	66.9	52.5	60
20070331	53	flood	4.9	125.9	219.4	101.8	89.3	87	90.1	111.5	136.7	105.6	114.4
20070331	53	ebb	5.3	71.7	163.6	50.9	37.6	34.9	37	44.2	66.4	47.4	53.4
20070331	54	flood	5.5	110.9	200.3	86.6	75.1	73.3	80.4	78.7	170	88.8	98
20070331	54	ebb	5.1	73.3	158.2	51.9	41.5	40	49.4	72.8	48.5	55.7	64.1
20070401	55	flood	5.2	128.5	218.4	109	98.3	97.6	105.6	104.2	177.6	116.8	126.9
20070401	55	ebb	5.5	64.2	147.8	47.2	37.5	35.9	40.4	43.6	56.5	46.5	54.2
20070401	56	flood	5.6	113.1	196.8	90.9	80.6	79.1	83.1	84.4	137.2	96.3	105.7
20070401	56	ebb	5.5	73.9	154.9	54.8	45.8	45.1	47.3	48.9	226.9	55.5	64.2
20070402	57	flood	5.5	135.2	217.4	114.6	104	104.6	119.1	114.5	152.1	125.3	138.2
20070402	57	ebb	5.7	73.5	151.9	56.1	46.3	45	46.4	63.2	101.7	59.9	68.6
20070402	58	flood	5.8	137.6	217.7	115.9	104.9	105.3	119	120.2	141.7	125.4	136.9
20070402	58	ebb	5.6	98.5	176.8	80.1	65.5	63	81.1	72.9	91.9	79	87.5
20070403	59	flood	5.6	141.8	223.6	122	106.8	105	108.7	112.2	192.3	122.5	133.2
20070403	59	ebb	5.8	103.8	182.6	87.6	71	68.4	77.8	83.4	111.9	88.5	99
20070403	60	flood	6	164.7	241.8	147.5	133.6	131.3	141.1	144.6	173.1	153.1	165.8
20070403	60	ebb	5.7	75.4	151.8	58.9	47.3	46.5	51.9	54.5	73.7	60.5	65.6
20070404	61	flood	5.5	176.4	255	158.9	144.8	143.2	149.7	168.1	162.1	173.2	185.1
20070404	61	ebb	7.6	71.8	146.6	57	44	42.7	46.2	69.6	89.5	60.2	66.9
20070404	62	flood	5.6	124.4	150.7	110.3	101.4	127	115.8	126.2	133	147.5	142.5
20070404	62	ebb	5.7	79	108.6	70.2	60.1	81.6	74.4	82.8	88.8	99	101.9
20070405	63	flood	5.6	129.3	157.2	116	108	127.4	120.8	129.2	137.1	145.9	146.8

ARGUS Mean SS Concentration [mg/l] per tidal phase in layers of 10 cm (*except first column 6 cm) [distances given in cm above bottom]

Date	*Tide no.*	*Phase*	*Tidal diff [m]*	*115-110*	*109-100*	*99-90*	*89-80*	*79-70*	*69-60*	*59-50*	*49-404*	*39-30*	*29-20*
20070405	63	ebb	5.8	108.1	137.8	99.4	89.6	110.6	104.4	113	118.6	129.1	128.9
20070405	64	flood	5.7	138.5	168.5	126.9	119.3	140.1	133.1	143.6	152.7	163.1	162.5
20070405	64	ebb	5.6	137.5	171.8	136.2	131.8	151.6	151.3	160.9	173.3	186.1	192.2
20070406	65	flood	5.5	148	180.9	139.6	132.6	149.4	145.8	155.2	163	175.5	175.9
20070406	65	ebb	16	88.3	115.5	78.4	91.2	83.4	77.1	89.4	96.6	100.5	100
20070406	66	flood	16.6	209.1	245	182.8	333	298.7	211.3	311.1	326.3	253.6	396.2
20070407	66	ebb	5.5	125.5	151.5	125.3	164.7	146	125.9	155.4	168.2	128.2	194.3
20070407	67	flood	5.4	143	169.1	136.8	179.8	163.2	141.9	177.4	191.1	154.8	223.5
20070407	67	ebb	5.4	62.2	88.3	60.8	102.6	80.8	59	92.4	105.2	60.5	124.3
20070407	68	flood	5.3	85.5	112.4	81.8	122.3	100.4	79.3	112.5	124.6	81.2	145.6
20070408	68	ebb	5.2	71.4	96.7	70.5	110.5	88.5	68	100.7	114	70.7	134.6
20070408	69	flood	5.1	82.2	108	79	118.1	96.2	76.7	108.6	121.2	78.4	143
20070408	69	ebb	5.2	54	80	55.6	95.2	71.6	52	85.8	98.6	54.4	120.5
20070408	70	flood	5	81.7	107.1	80.1	117.9	94.2	75.9	107.2	121.6	78.7	143.9
20070409	70	ebb	4.8	42.7	67.8	44.9	83.2	55.9	38.9	68.7	84.2	40	105.7
20070409	71	flood	5	74.5	100.6	74.2	116.7	88.8	69.9	101.6	114.8	72.3	138.3
20070409	71	ebb	4.8	47.1	74	49.6	88.1	62.5	44	74.8	89.2	44.3	109
20070409	72	flood	4.6	58	84.4	60.1	97.3	72	54.4	84.5	99.8	56.6	121.4
20070410	72	ebb	4.7	61.2	87.5	65.7	104.8	80.7	65	95.7	111.5	70.4	136.1
20070410	73	flood	4.6	91.3	121.6	91.7	133.7	113.4	91.3	126.6	139.3	97.7	165.6
20070410	73	ebb	4.3	37.9	66.2	42.2	81.3	54.2	35	66	78.7	36.1	101.4
20070410	74	flood	3.9	38.9	64.5	41.1	72	51.6	34.5	63.8	77.1	34.7	95.7
20070411	74	ebb	4.1	25.8	51.9	32.9	61.8	39.3	24.3	50.3	65.7	23.1	84
20070411	75	flood	4.2	46.7	74.8	47.9	81.1	60.8	40.7	71.5	84.5	40.7	101.2
20070411	75	ebb	4	48.6	79.1	50.4	85.2	67.9	45.3	77.7	90.8	47	109

ARGUS Mean SS Concentration [mg/l] per tidal phase in layers of 10 cm (*except first column 6 cm) [distances given in cm above bottom]

Date	*Tide no.*	*Phase*	*Tidal diff [m]*	*115-110*	*109-100*	*99-90*	*89-80*	*79-70*	*69-60*	*59-50*	*49-404*	*39-30*	*29-20*
20070411	76	flood	3.5	37.5	64.6	40.1	71.8	50.7	32.5	60.6	75.4	30.7	92.2
20070412	76	ebb	3.7	28.1	53.7	34	62.9	41.1	25.7	50.3	66.2	24	84.6
20070412	77	flood	3.9	54.9	83.6	56.8	90	70.7	50.1	80	91.2	49.8	112
20070412	77	ebb	3.9	32.9	60.5	36	66.7	48.3	27.8	56.7	68.8	25.7	87
20070412	78	flood	3.6	60.5	88.2	58.9	91.6	76.6	54.2	84.5	94.4	53.5	114.7
20070413	78	ebb	3.9	118	149.2	122.8	154.9	143.1	122	151.6	158.5	124.9	187.8
20070413	79	flood	4.4	95.8	125.9	96.1	128.6	115.6	94	125.4	131.7	95	157.3
20070413	79	ebb	4.4	39.6	68.1	42.7	74.2	57.8	37.1	66.7	73.3	35.1	94.2
20070414	80	flood	4.3	71.9	100.6	72.2	102.7	87.5	70.1	97.7	103.6	67.2	126.8
20070414	80	ebb	4.6	69.5	101	74.5	107.1	94.8	74.4	103.7	110.5	74.5	117.8
20070414	81	flood	5.1	122.4	151	120.7	151	138.7	121	149.9	155.7	122.9	145.8
20070414	81	ebb	5	40.3	68.6	45.2	74	56.9	39.1	65.8	73.8	37.3	58.2
20070415	82	flood	4.9	98.4	128	99.6	127.5	113.4	92.9	121.7	127.8	93.6	116.5
20070415	82	ebb	5.3	38.8	65.6	45.2	71	52.6	34	62.2	70.1	35.9	56.5
20070415	83	flood	5.8	98	126.6	99.8	125.9	111	91.7	119.1	126.7	95	114.2
20070415	83	ebb	5.6	60.4	88.3	63.4	89.3	73.8	50	75.7	87	52.1	69.9
20070416	84	flood	5.5	99.4	126.8	98.8	125.9	111.7	87.8	113	123.7	90.4	110.6
20070416	84	ebb	5.8	52.5	80.8	58.6	84.4	67.4	46.3	73.1	82.2	52.8	70.2
20070416	85	flood	6.3	103.8	130	102.9	129.6	115.1	92.3	119.6	127	96.9	116.4
20070416	85	ebb	5.9	82.8	112.2	85.9	115.4	104	75.5	107.2	113	79.4	96.8
20070417	86	flood	5.8	116.8	145.9	117.8	147.1	136.2	109.3	141.8	148.5	117.9	138.5
20070417	86	ebb	6.2	81.5	111.4	86.5	116	103.1	78.6	109.8	116.2	84.2	102.9
20070417	87	flood	6.5	104.1	131.9	103.4	131.9	118.4	90.8	124	129.1	96.9	114.4
20070417	87	ebb	6.1	118.9	148.2	122.8	152.7	142.3	116.4	148.1	157.2	129	147.3
20070418	88	flood	6.1	149.9	179.3	148.3	176.9	165.3	146.2	177.2	186.6	156.9	180

ALTUS Echosounder bottom distance [cm]						
Date	**Tide no.**	**Phase**	**Signal 1**	**Signal 2**	**Signal 3**	**Signal 4**
20070209	1	flood	45.7	46.81	-	-
20070210	1	ebb	37.92	38.49	-	-
20070210	2	flood	37.83	38.37	-	-
20070210	2	ebb	37.34	37.38	37.42	-
20070210	3	flood	37.38	37.88	38.08	-
20070211	3	ebb	37.17	37.22	37.22	37.3
20070211	4	flood	37.22	37.88	-	-
20070211	4	ebb	37.17	37.42	37.96	-
20070211	5	flood	37.42	37.75	37.79	-
20070212	5	ebb	37.79	37.79	38.2	-
20070212	6	flood	37.34	37.55	38.12	-
20070212	6	ebb	37.13	37.22	-	-
20070212	7	flood	37.5	37.71	-	-
20070213	7	ebb	37.88	-	-	-
20070213	8	flood	37.59	37.63	-	-
20070213	8	ebb	37.71	38.2	-	-
20070214	9	flood	37.92	38.16	38.53	-
20070214	9	ebb	37.83	39.27	39.27	-
20070214	10	flood	38	38.04	38.74	39.36
20070214	10	ebb	38.78	39.36	-	-
20070215	11	flood	38.82	39.44	-	-
20070215	11	ebb	39.27	39.36	40.8	-
20070215	12	flood	40.67	41.62	-	-
20070215	12	ebb	40.67	40.72	41.66	-
20070216	13	flood	41.58	41.62	41.75	-
20070216	13	ebb	44.71	-	-	-
20070216	14	flood	45.66	-	-	-
20070216	14	ebb	44.96	-	-	-
20070217	15	flood	-	-	-	-
20070217	15	ebb	-	-	-	-
20070217	16	flood	45.21	45.58	-	-
20070217	16	ebb	45.33	45.58	-	-
20070218	17	flood	-	-	-	-
20070218	17	ebb	-	-	-	-
20070218	18	flood	-	-	-	-
20070218	18	ebb	-	-	-	-
20070219	19	flood	-	-	-	-
20070219	19	ebb	44.59	-	-	-
20070219	20	flood	44.26	-	-	-
20070219	20	ebb	44.09	-	-	-
20070220	21	flood	-	-	-	-
20070220	21	ebb	42.69	43.02	-	-

ALTUS Echosounder bottom distance [cm]

Date	Tide no.	Phase	Signal 1	Signal 2	Signal 3	Signal 4
20070220	22	flood	-	-	-	-
20070221	22	ebb	-	-	-	-
20070221	23	flood	41.83	-	-	-
20070222	23	ebb	48.01	48.09	48.3	-
20070222	24	flood	48.34	-	-	-
20070222	24	ebb	47.02	-	-	-
20070222	25	flood	47.22	47.55	-	-
20070223	25	ebb	47.02	-	-	-
20070223	26	flood	45.25	-	-	-
20070223	26	ebb	44.96	-	-	-
20070223	27	flood	44.34	-	-	-
20070224	27	ebb	43.76	44.18	44.51	-
20070224	28	flood	43.56	43.97	44.05	-
20070224	28	ebb	43.27	43.35	43.76	-
20070224	29	flood	43.6	44.01	44.05	-
20070225	29	ebb	43.19	43.97	-	-
20070225	30	flood	43.27	-	-	-
20070225	30	ebb	43.72	-	-	-
20070225	31	flood	44.05	-	-	-
20070226	31	ebb	42.32	-	-	-
20070226	32	flood	43.68	-	-	-
20070226	32	ebb	-	-	-	-
20070226	33	flood	40.67	-	-	-
20070227	33	ebb	40.67	-	-	-
20070227	34	flood	40.26	40.55	-	-
20070227	34	ebb	37.34	37.46	37.46	-
20070228	35	flood	36.15	36.15	36.39	-
20070228	35	ebb	34.83	34.87	-	-
20070228	36	flood	35.28	35.28	35.32	35.32
20070228	36	ebb	35.45	35.45	35.45	35.49
20070301	37	flood	35.24	35.24	35.24	35.28
20070301	37	ebb	35.32	35.32	35.36	-
20070301	38	flood	32.6	32.64	32.64	32.64
20070301	38	ebb	31.29	32.97	33.06	-
20070302	39	flood	30.38	30.38	30.42	30.5
20070302	39	ebb	29.51	29.6	30.01	30.01
20070302	40	flood	29.8	29.8	29.84	29.84
20070302	40	ebb	29.76	29.76	29.8	29.97
20070303	41	flood	27.91	27.91	27.91	27.95
20070303	41	ebb	28.28	28.28	28.28	28.36
20070303	42	flood	28.03	28.03	28.07	28.07
20070303	42	ebb	28.03	28.03	28.07	28.11

ALTUS Echosounder bottom distance [cm]

Date	Tide no.	Phase	Signal 1	Signal 2	Signal 3	Signal 4
20070304	43	flood	28.2	28.2	28.2	28.24
20070304	43	ebb	27.87	27.87	27.87	27.95
20070304	44	flood	28.44	28.44	28.48	28.48
20070304	44	ebb	27.99	27.99	28.03	28.32
20070305	45	flood	27.08	27.13	27.17	27.33
20070305	45	ebb	27.37	27.45	-	-
20070305	46	flood	26.88	26.92	26.96	26.96
20070305	46	ebb	27.29	27.29	-	-
20070306	47	flood	26.22	26.22	-	-
20070306	47	ebb	26.05	26.3	26.34	-
20070306	48	flood	26.59	26.67	-	-
20070306	48	ebb	25.93	25.97	26.14	26.26
20070307	49	flood	25.48	25.52	25.68	-
20070307	49	ebb	39.48	39.73	39.73	-
20070307	50	flood	-	-	-	-
20070308	50	ebb	34.09	-	-	-
20070308	51	flood	32.73	32.77	32.81	-
20070308	51	ebb	-	-	-	-
20070308	52	flood	31.37	31.37	31.41	31.41
20070309	52	ebb	31.24	31.37	-	-
20070309	53	flood	29.93	29.97	30.09	30.17
20070309	53	ebb	29.8	29.84	30.38	-
20070309	54	flood	29.47	29.47	29.64	-
20070310	54	ebb	29.64	29.68	30.59	-
20070310	55	flood	29.1	29.23	29.89	-
20070310	55	ebb	28.98	29.23	29.35	-
20070310	56	flood	28.32	28.36	29.23	-
20070311	56	ebb	27.62	28.07	28.94	-
20070311	57	flood	26.8	28.65	-	-
20070311	57	ebb	26.75	26.88	27.08	-
20070311	58	flood	26.43	26.51	26.51	-
20070312	58	ebb	26.05	26.1	-	-
20070312	59	flood	25.81	26.26	-	-
20070312	59	ebb	26.01	26.26	-	-
20070312	60	flood	24.86	25.11	-	-
20070313	60	ebb	24.45	24.53	-	-
20070313	61	flood	23.91	24.08	-	-
20070313	61	ebb	23.95	24.49	-	-
20070313	62	flood	24	24.37	-	-
20070314	62	ebb	25.6	-	-	-
20070314	63	flood	23.17	-	-	-
20070314	63	ebb	25.4	-	-	-

ALTUS Echosounder bottom distance [cm]

Date	Tide no.	Phase	Signal 1	Signal 2	Signal 3	Signal 4
20070314	64	flood	22.76	-	-	-
20070315	64	ebb	22.84	22.92	-	-
20070315	65	flood	22.88	22.92	23.05	-
20070315	65	ebb	22.14	-	-	-
20070316	66	flood	23.05	23.34	-	-
20070316	66	ebb	21.81	21.85	21.9	21.94
20070316	67	flood	21.52	21.94	22.02	22.35
20070316	67	ebb	21.61	21.65	-	-
20070317	68	flood	21.28	21.4	21.44	-
20070317	68	ebb	21.28	21.52	21.52	21.9
20070317	69	flood	21.32	21.65	21.69	-
20070317	69	ebb	21.4	21.44	21.65	-
20070318	70	flood	21.44	21.48	21.73	21.98
20070318	70	ebb	21.48	21.52	21.65	-
20070318	71	flood	21.03	21.03	21.32	21.61
20070318	71	ebb	21.36	21.61	21.65	21.69
20070319	72	flood	21.44	22.59	-	-
20070319	72	ebb	21.52	21.52	21.65	-
20070319	73	flood	22.14	22.43	22.59	-
20070319	73	ebb	21.69	22.06	22.14	-
20070320	74	flood	21.85	22.06	22.31	-
20070320	74	ebb	21.65	21.81	22.1	22.27
20070320	75	flood	21.94	22.39	-	-
20070320	75	ebb	21.73	21.77	22.06	-
20070321	76	flood	21.77	21.85	-	-
20070323	76	ebb	41.09	41.29	-	-
20070323	77	flood	39.36	39.36	39.36	39.4
20070324	77	ebb	38.66	38.66	38.7	39.07
20070324	78	flood	38.29	38.41	38.7	38.78
20070324	78	ebb	37.92	38.16	38.78	38.82
20070324	79	flood	37.09	37.26	37.38	-
20070325	79	ebb	38.24	39.23	-	-
20070325	80	flood	35.12	35.53	-	-
20070325	80	ebb	35.57	35.61	35.65	-
20070325	81	flood	34.95	-	-	-
20070326	81	ebb	35.24	-	-	-
20070326	82	flood	34.5	-	-	-
20070326	82	ebb	35.03	-	-	-
20070326	83	flood	32.89	32.89	32.89	-
20070327	83	ebb	33.26	33.55	-	-
20070327	84	flood	32.6	32.64	32.77	32.85
20070327	84	ebb	33.06	33.39	-	-

ALTUS Echosounder bottom distance [cm]

Date	Tide no.	Phase	Signal 1	Signal 2	Signal 3	Signal 4
20070327	85	flood	32.31	32.31	32.36	32.48
20070328	85	ebb	33.02	-	-	-
20070328	86	flood	32.31	32.4	32.52	-
20070328	86	ebb	32.23	32.27	-	-
20070329	87	flood	30.87	32.27	-	-
20070329	87	ebb	31.2	31.53	-	-
20070329	88	flood	30.67	30.79	-	-
20070329	88	ebb	31.04	31.08	-	-
20070330	89	flood	30.34	-	-	-
20070330	89	ebb	29.64	31.33	-	-
20070330	90	flood	29.39	29.43	29.51	-
20070330	90	ebb	29.51	29.51	-	-
20070331	91	flood	29.02	-	-	-
20070331	91	ebb	28.81	-	-	-
20070331	92	flood	28.28	28.36	-	-
20070331	92	ebb	28.28	28.36	28.53	-
20070401	93	flood	27.41	27.62	-	-
20070401	93	ebb	27.41	27.7	-	-
20070401	94	flood	27.37	-	-	-
20070401	94	ebb	26.92	27.13	-	-
20070402	95	flood	26.75	26.96	27.41	-
20070402	95	ebb	26.8	26.92	27.33	-
20070402	96	flood	26.84	27.04	27.17	-
20070402	96	ebb	26.63	26.71	-	-
20070403	97	flood	25.93	26.01	-	-
20070403	97	ebb	26.71	-	-	-
20070403	98	flood	25.6	-	-	-
20070403	98	ebb	25.52	25.56	25.6	-
20070404	99	flood	25.23	25.68	-	-
20070404	99	ebb	46.28	46.48	-	-
20070405	100	flood	46.07	46.15	-	-
20070405	100	ebb	43.85	-	-	-
20070405	101	flood	41.66	41.75	-	-
20070405	101	ebb	-	-	-	-
20070406	102	flood	39.23	39.36	-	-
20070406	102	ebb	-	-	-	-
20070406	103	flood	42.69	42.69	42.69	42.69
20070407	103	ebb	42.28	42.28	42.36	42.57
20070407	104	flood	40.02	40.02	40.1	40.1
20070407	104	ebb	39.93	40.14	40.18	40.39
20070407	105	flood	39.98	39.98	40.02	40.02
20070408	105	ebb	39.65	39.69	39.73	39.85

ALTUS Echosounder bottom distance [cm]

Date	Tide no.	Phase	Signal 1	Signal 2	Signal 3	Signal 4
20070408	106	flood	38.86	38.86	38.99	39.15
20070408	106	ebb	38.86	38.95	38.99	-
20070408	107	flood	38.9	39.07	39.15	39.32
20070409	107	ebb	38.62	38.82	38.82	38.86
20070409	108	flood	38.53	38.58	38.58	38.58
20070409	108	ebb	38.49	38.53	38.53	38.66
20070409	109	flood	38.2	38.24	38.29	38.9
20070410	109	ebb	38.37	38.41	38.58	38.99
20070410	110	flood	36.89	36.93	36.93	36.97
20070410	110	ebb	37.26	38.41	38.74	-
20070410	111	flood	36.89	36.93	37.17	-
20070411	111	ebb	37.17	38.41	38.86	-
20070411	112	flood	36.84	36.84	36.93	37.01
20070411	112	ebb	36.89	37.01	37.01	-
20070411	113	flood	36.19	36.23	36.31	-
20070412	113	ebb	36.39	36.43	37.09	-
20070412	114	flood	36.02	36.02	36.06	36.06
20070412	114	ebb	36.15	36.15	36.27	-
20070412	115	flood	35.45	35.45	35.49	35.57
20070413	115	ebb	35.12	35.65	35.86	-
20070413	116	flood	33.88	34	34	-
20070413	116	ebb	34.21	34.54	-	-
20070414	117	flood	33.76	33.88	33.96	34
20070414	117	ebb	33.88	33.96	33.96	34.04
20070414	118	flood	33.72	33.76	33.8	33.88
20070414	118	ebb	33.59	33.67	33.72	-
20070415	119	flood	33.84	33.88	33.88	-
20070415	119	ebb	33.51	33.55	33.59	-
20070415	120	flood	33.18	33.18	33.18	33.22
20070415	120	ebb	33.18	33.26	33.59	-
20070416	121	flood	32.52	33.47	33.76	-
20070416	121	ebb	32.69	32.73	-	-
20070416	122	flood	32.56	32.81	32.81	-
20070416	122	ebb	32.36	32.81	32.85	-
20070417	123	flood	32.07	32.44	32.73	-
20070417	123	ebb	31.2	32.15	-	-
20070417	124	flood	31.94	32.07	32.11	32.19
20070417	124	ebb	31.86	-	-	-
20070418	125	flood	30.05	30.09	30.17	-

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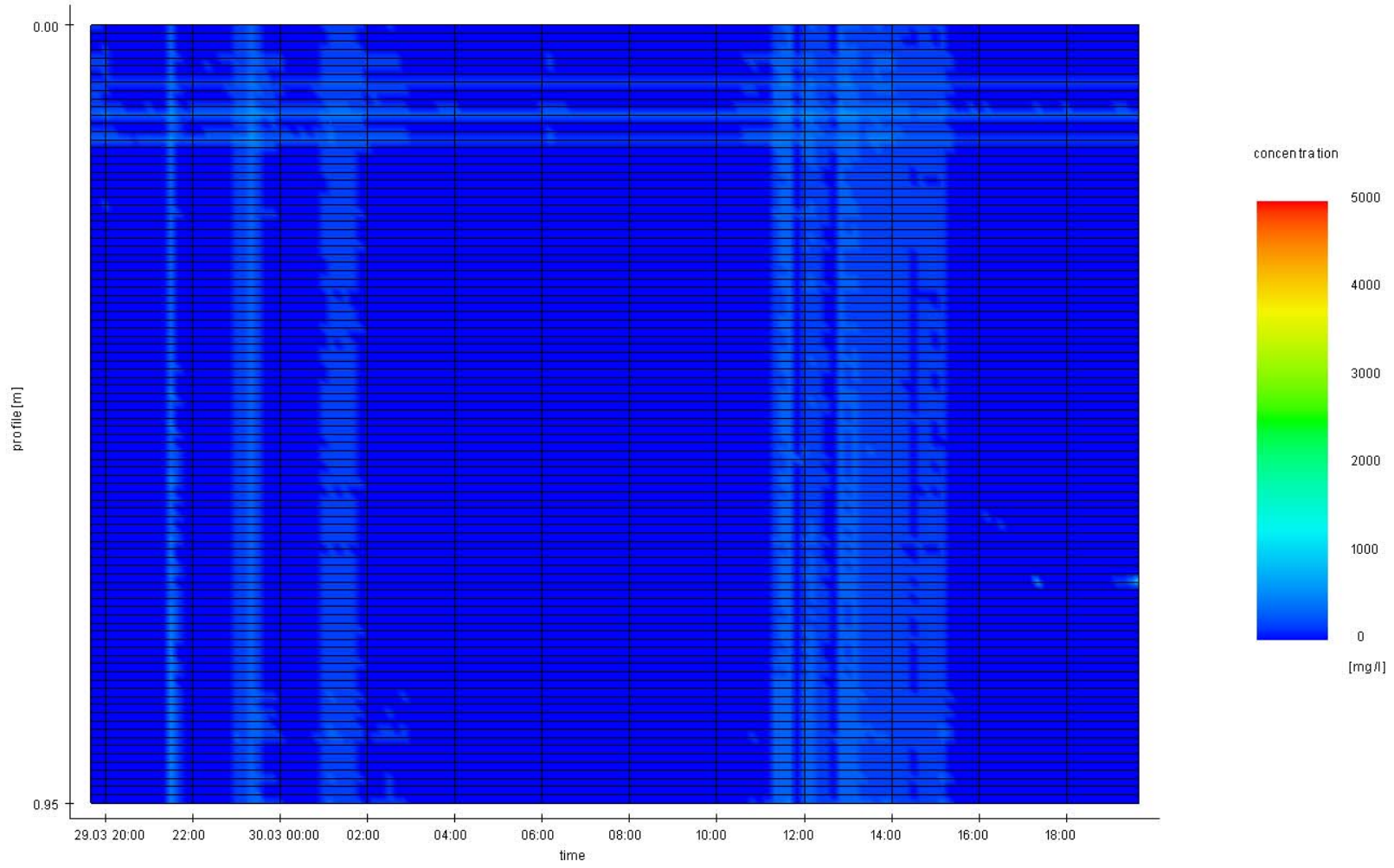
11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



Time series suspended sediment concentration
ARGUS ASM-IV

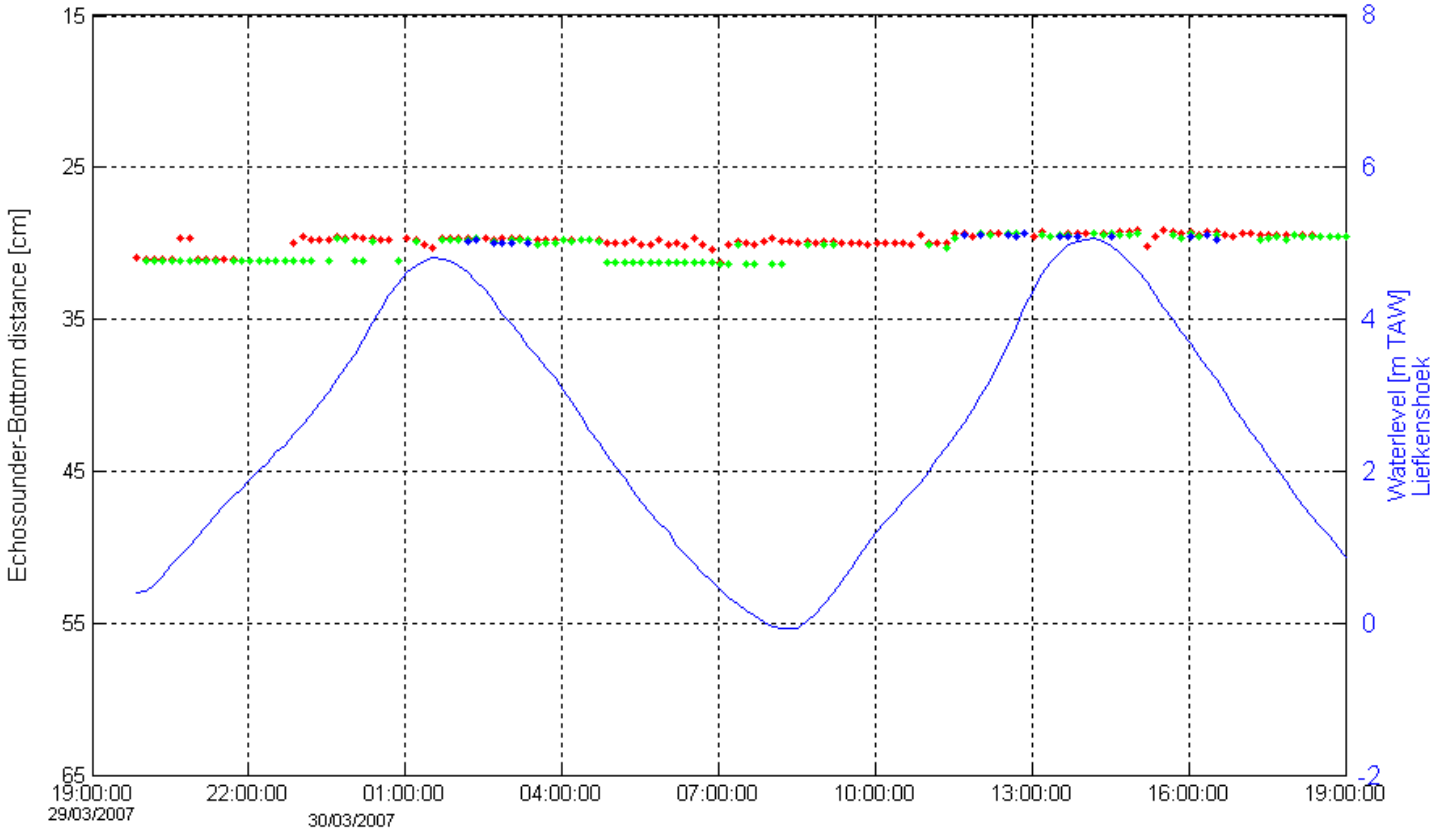
Location:	Date:
Deurganckdok Sill	Avg Tide 29/03 – 30/03

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok - Near bed continuous monitoring – Winter 2007



SIGNAL 4
SIGNAL 3
SIGNAL 2
SIGNAL 1

Legend

Echosounder – bottom distance
Waterlevel [mTAW] at Liefkenshoek

Location:
Deurganckdok Sill

Date:
Avg Tide 29/03 – 30/03

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

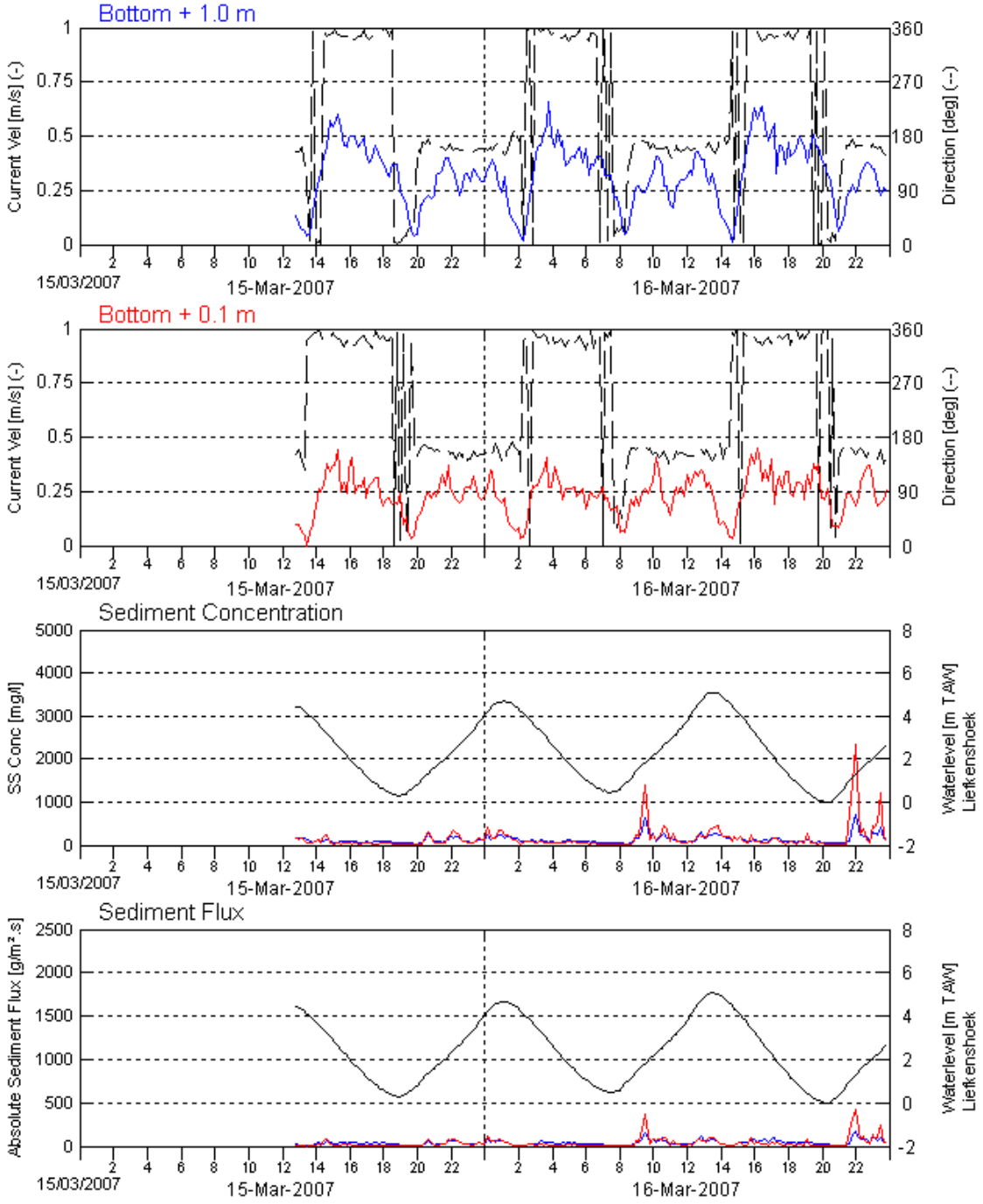
I/RA/11283/06.123/MSA

APPENDIX D.

TIMESERIES RCM9 & VALEPORT

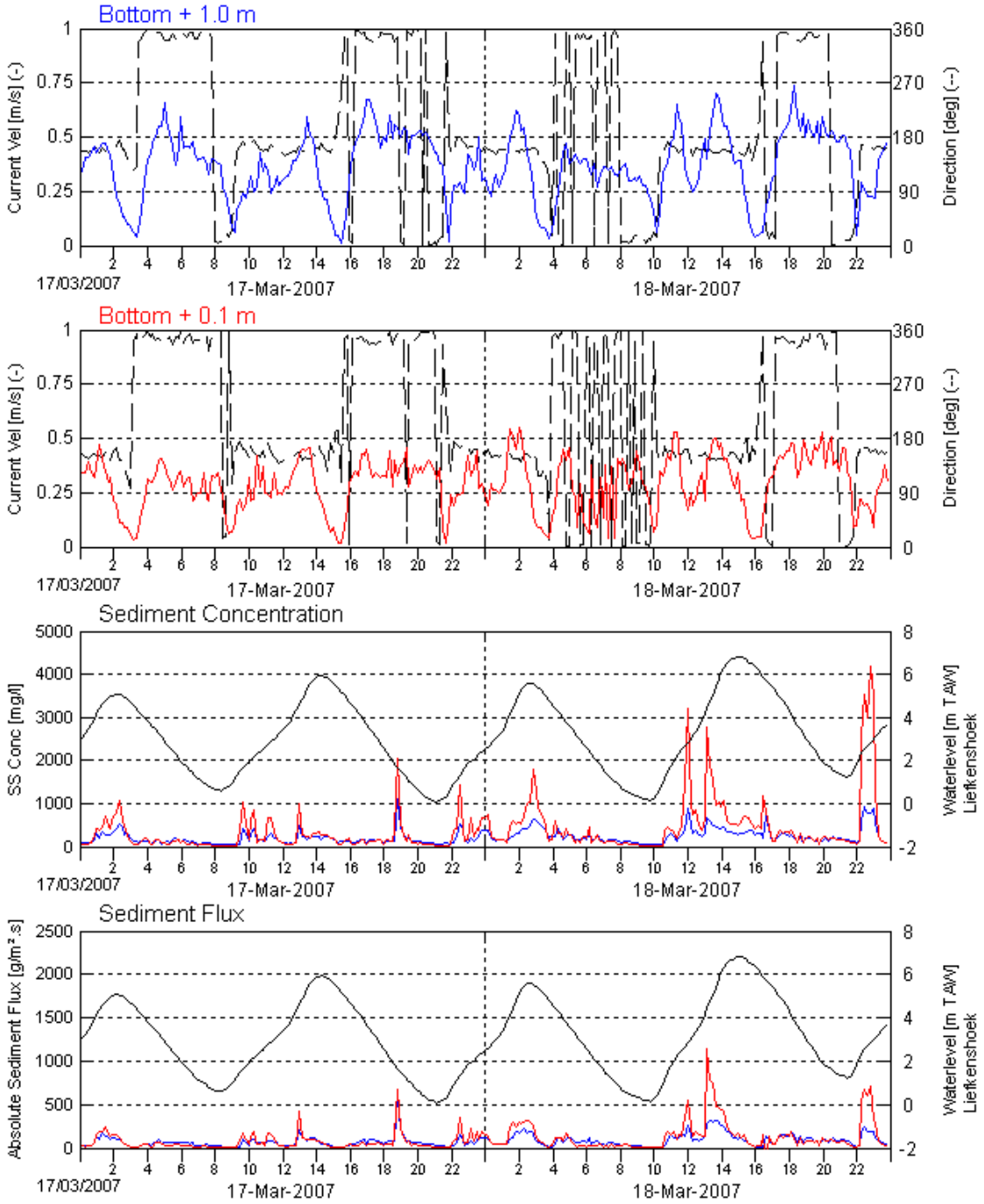
D.1 CDW frame

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel		Data processed by: IMDC
Location: Deurganckdok CDW	Date: 15/03/2007– 16/03/2007	In association with: WL | delft hydraulics, GEMS International
		I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok CDW

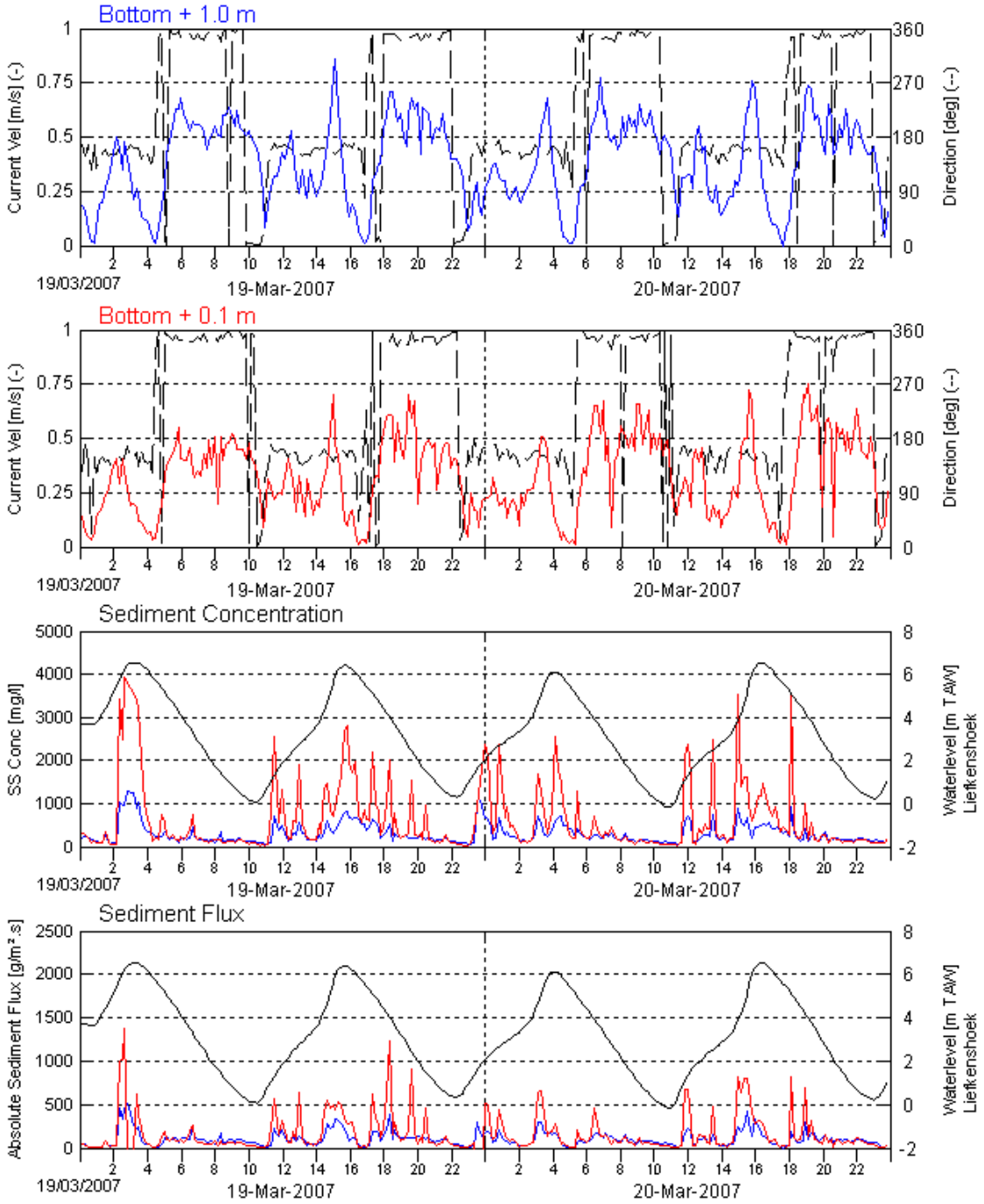
Date: 17/03/2007– 18/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok CDW

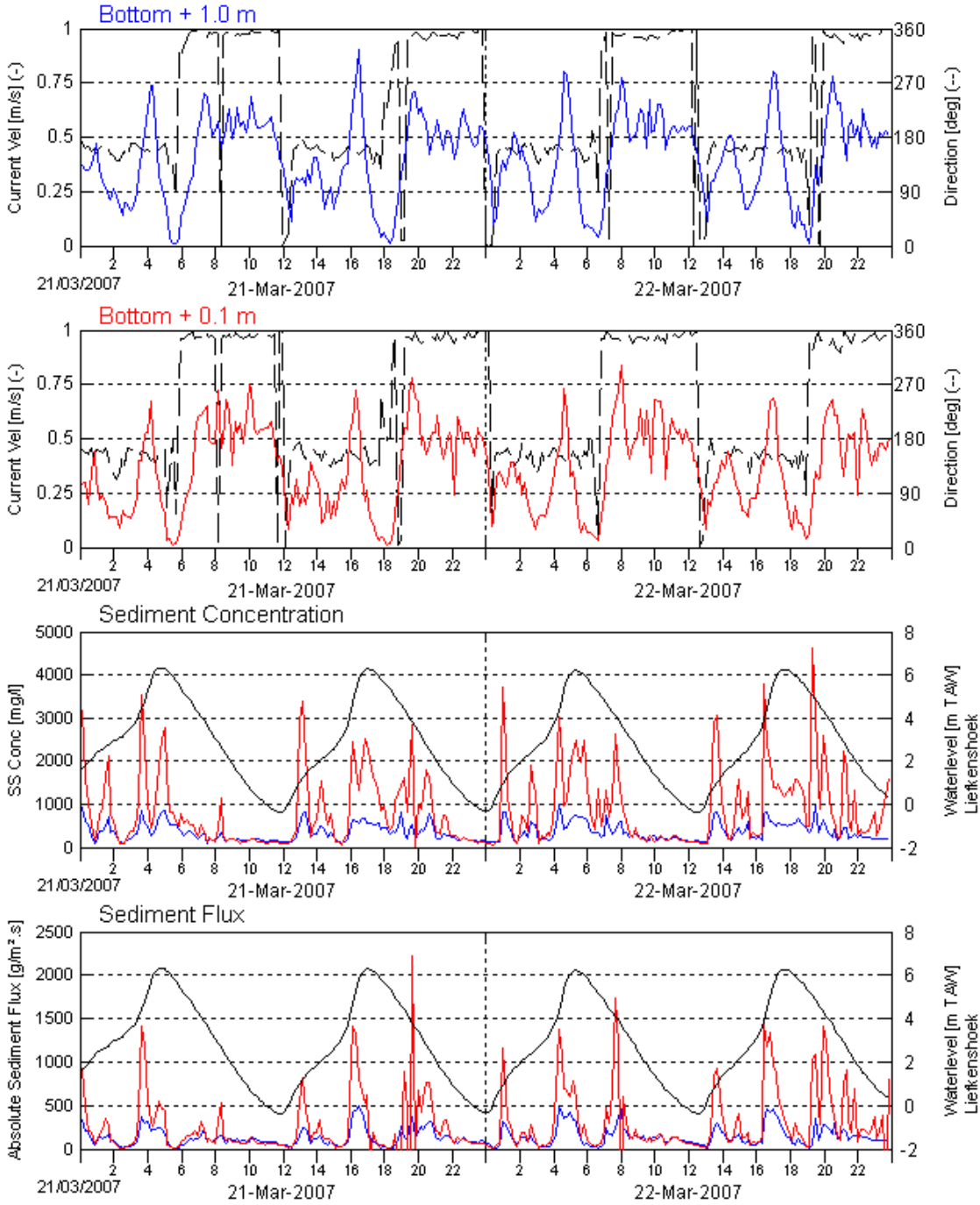
Date:
1903/2007– 20/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok CDW

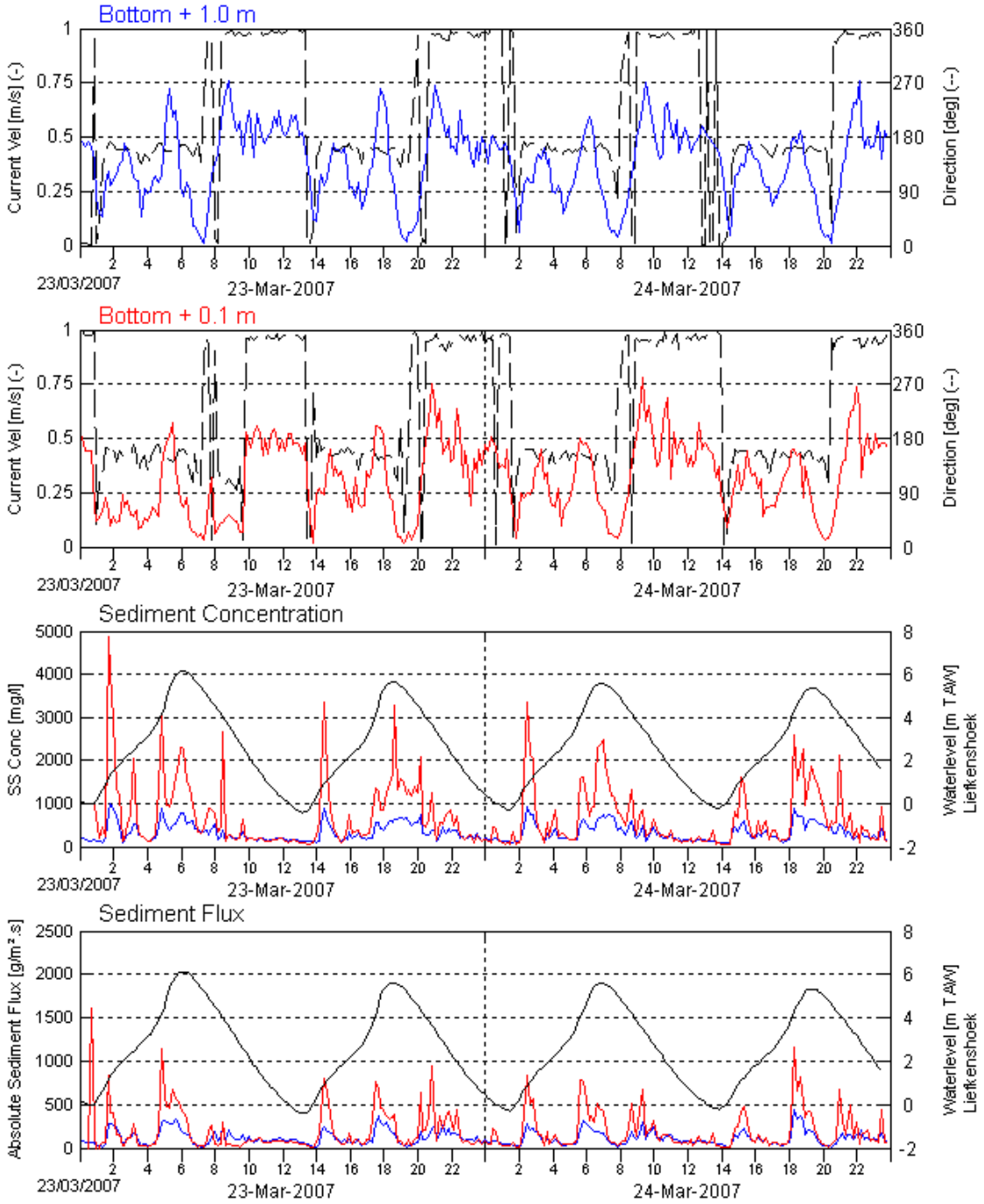
Date: 21/03/2007– 22/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok CDW

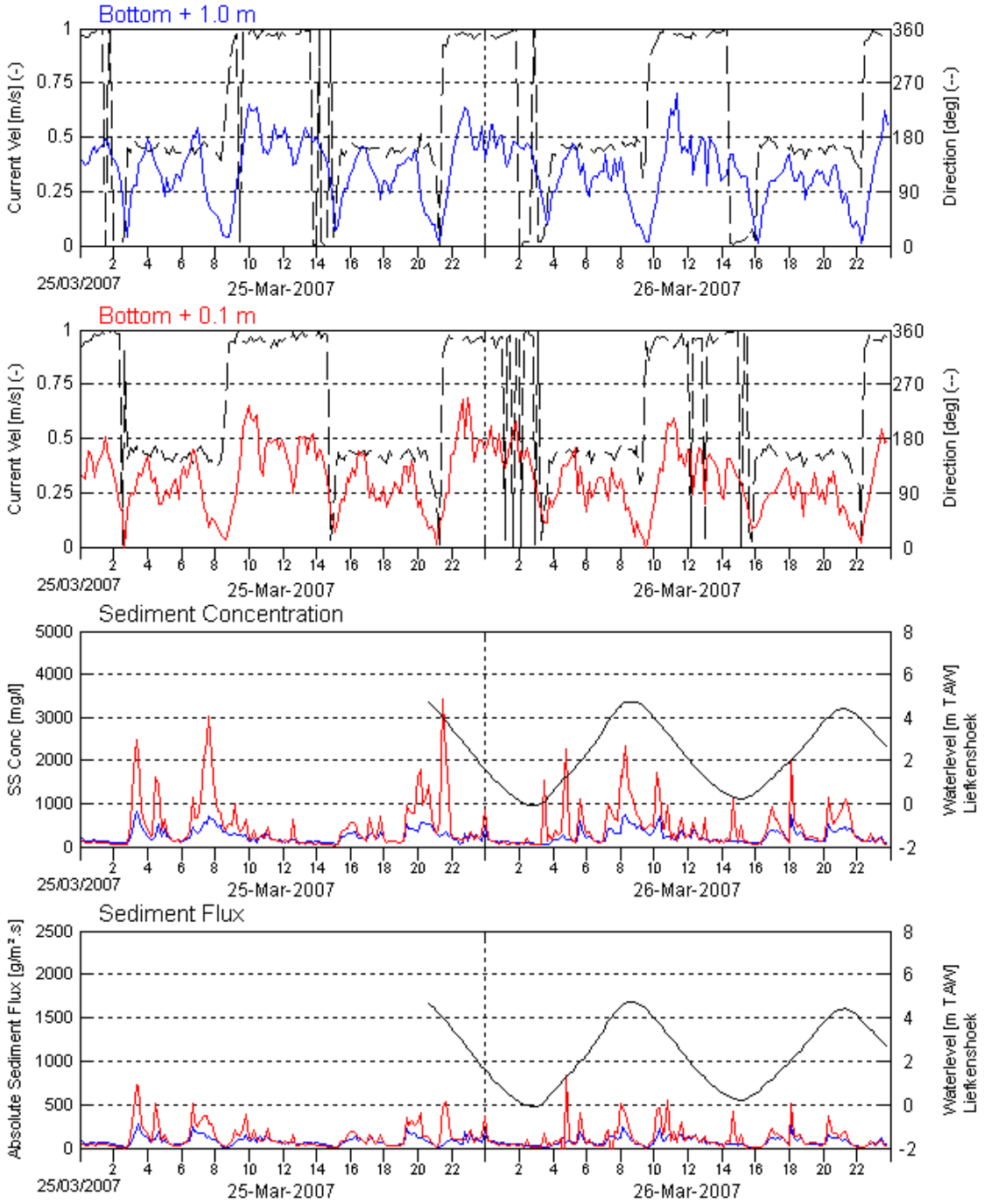
Date: 23/03/2007– 24/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok CDW

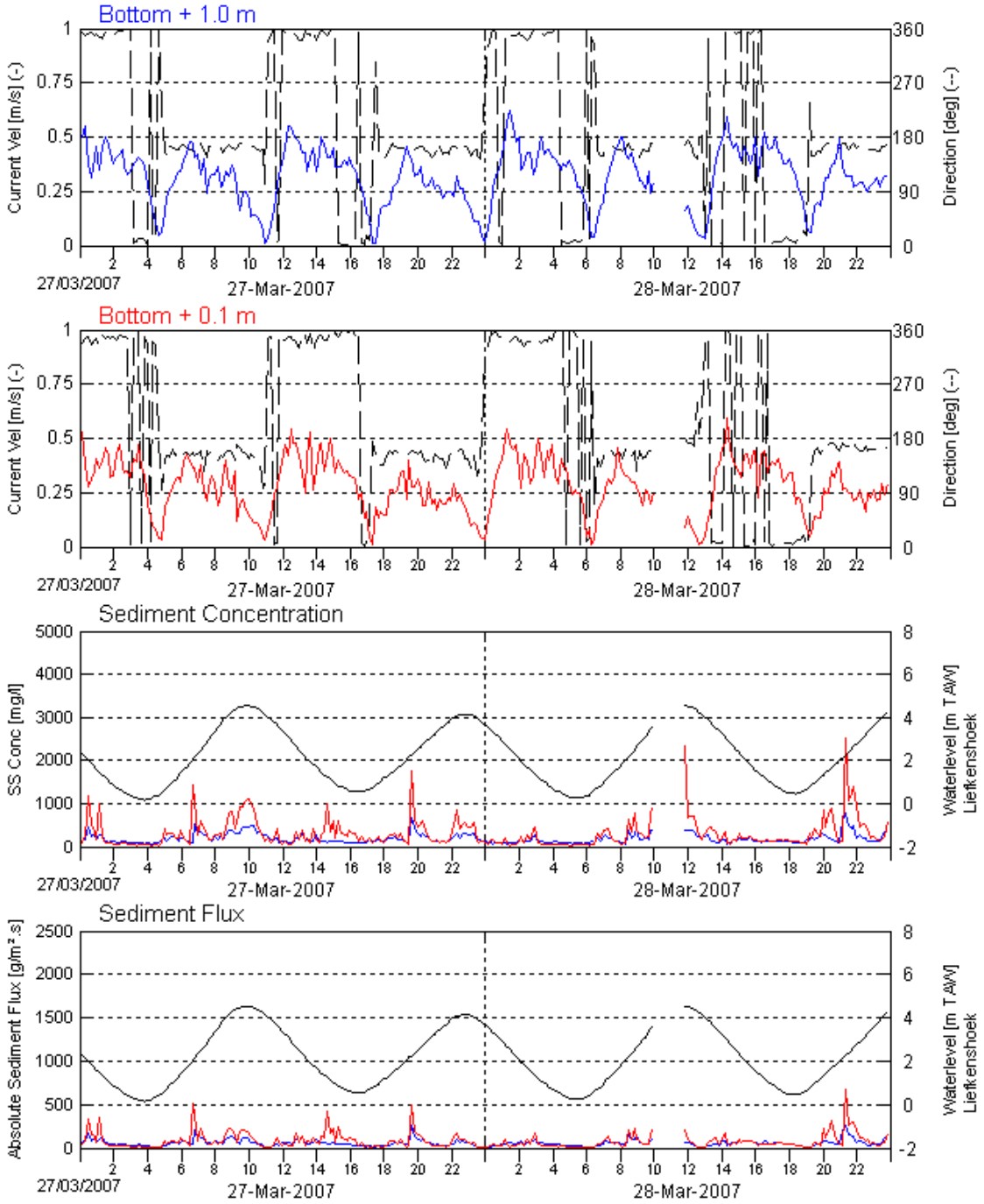
Date: 25/03/2007– 26/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok CDW

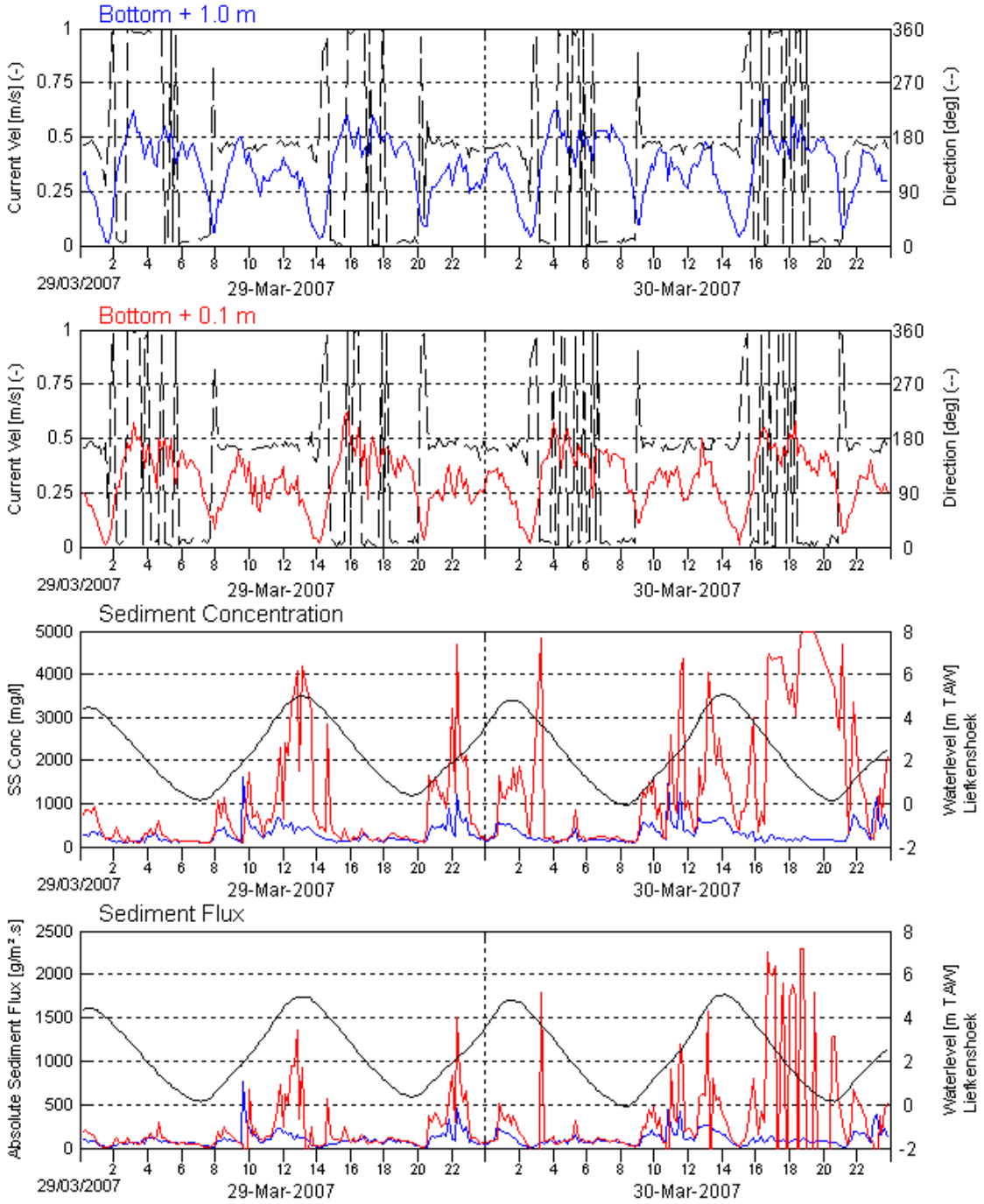
Date:
27/03/2007– 28/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok CDW

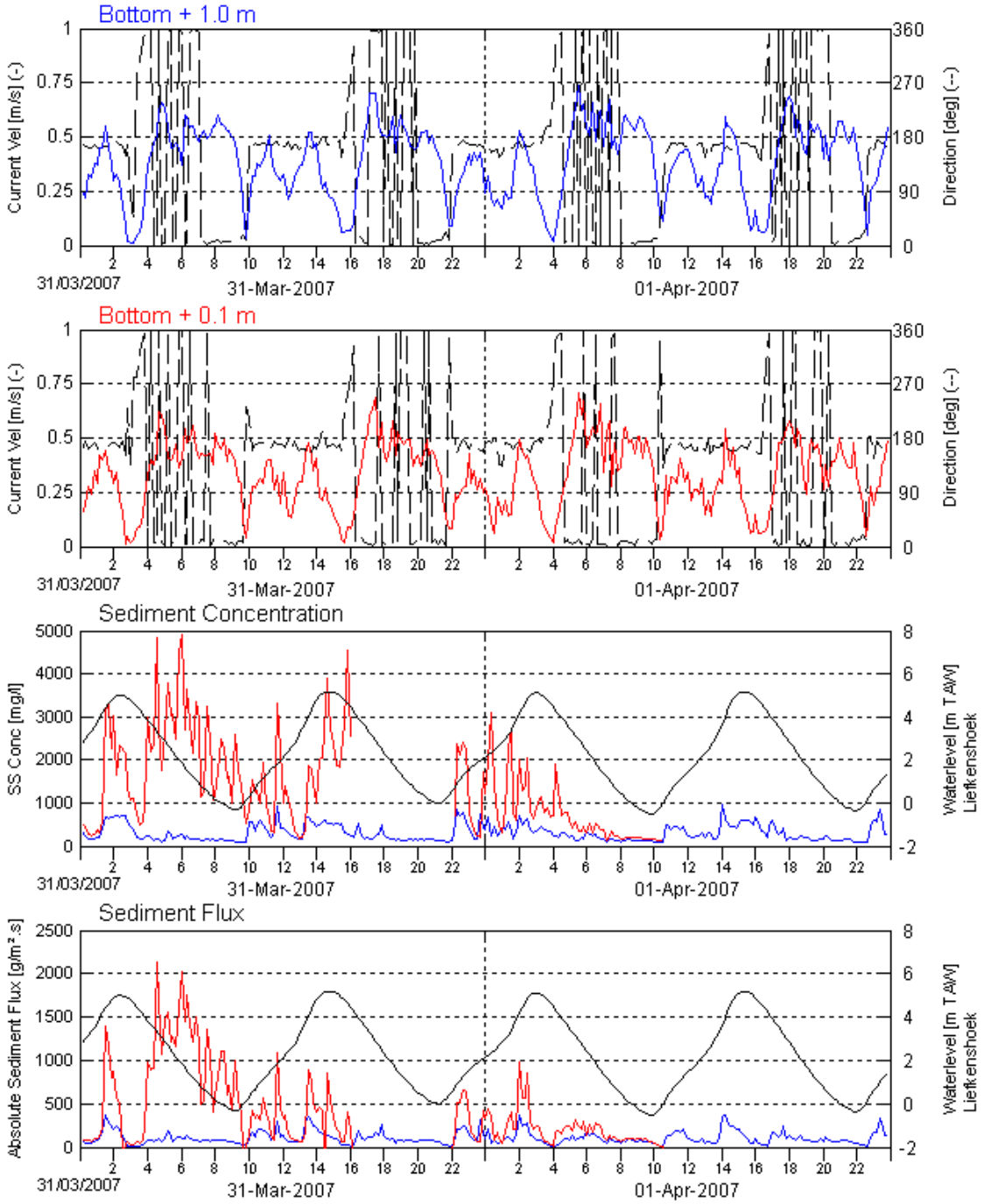
Date:
29/03/2007– 30/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok CDW

Date: 31/03/2007– 01/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

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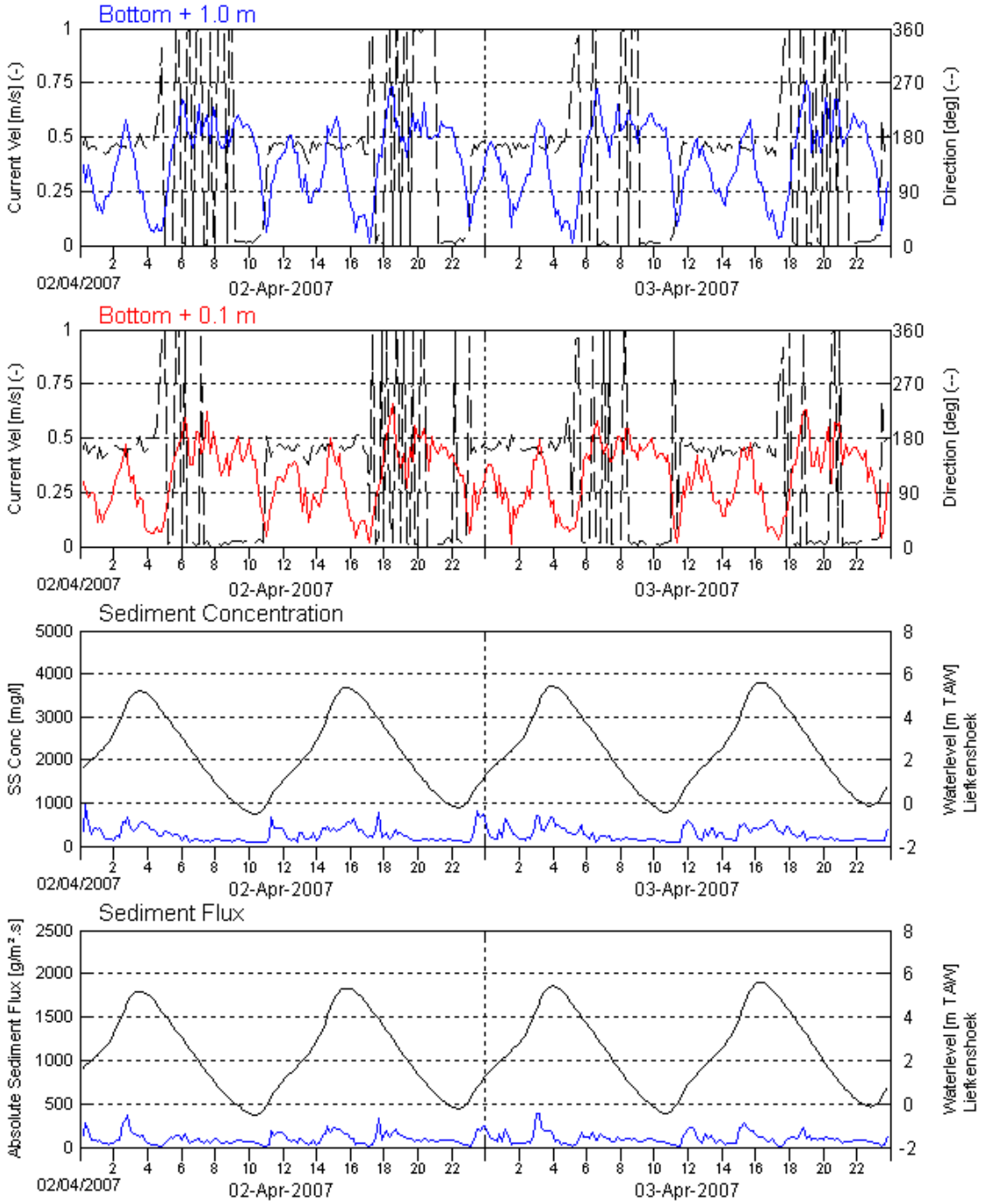
11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007

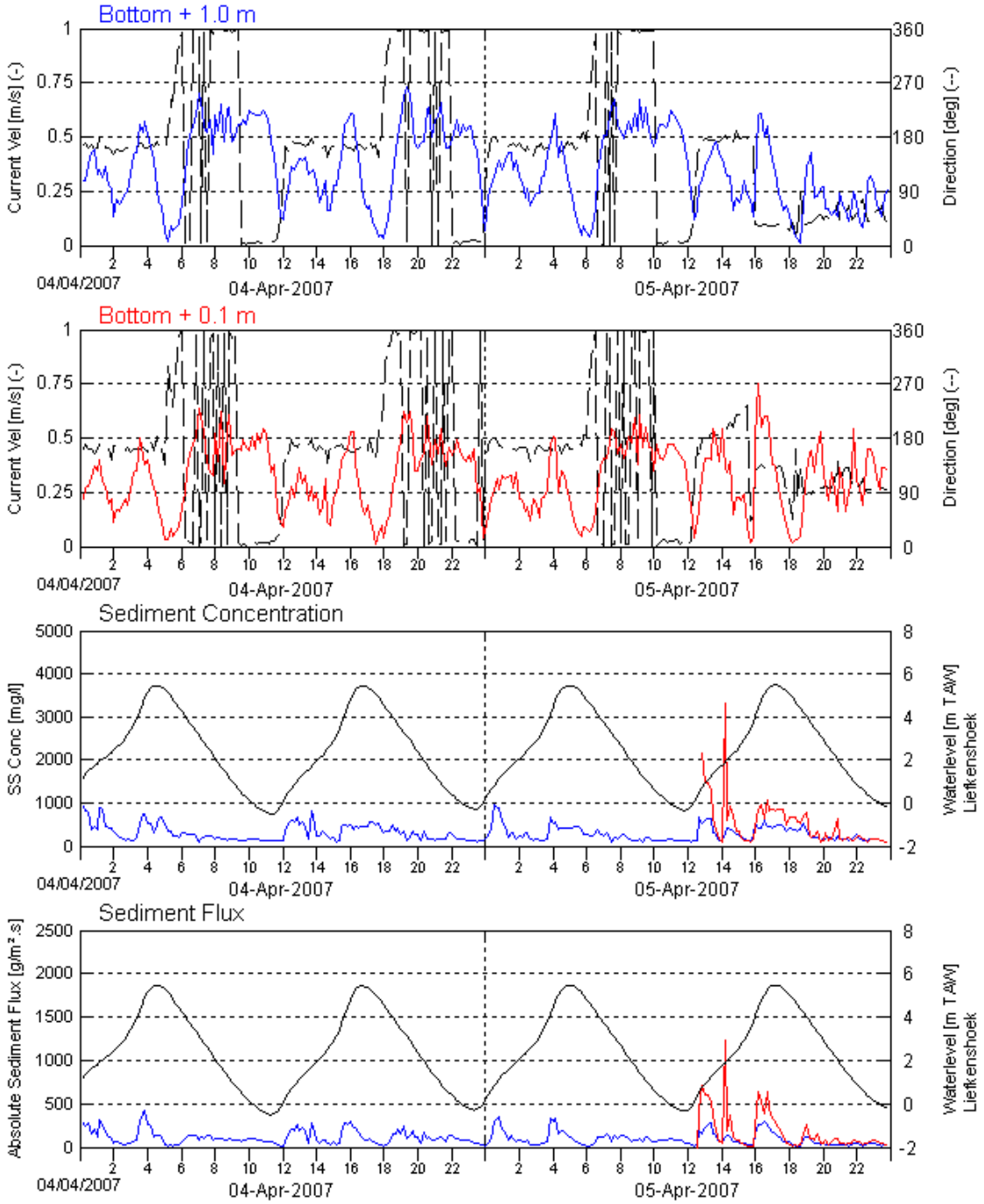


Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:	Date:	*Data processed by:* IMDC
Deurganckdok CDW	02/04/2007– 03/04/2007	*In association with:* WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

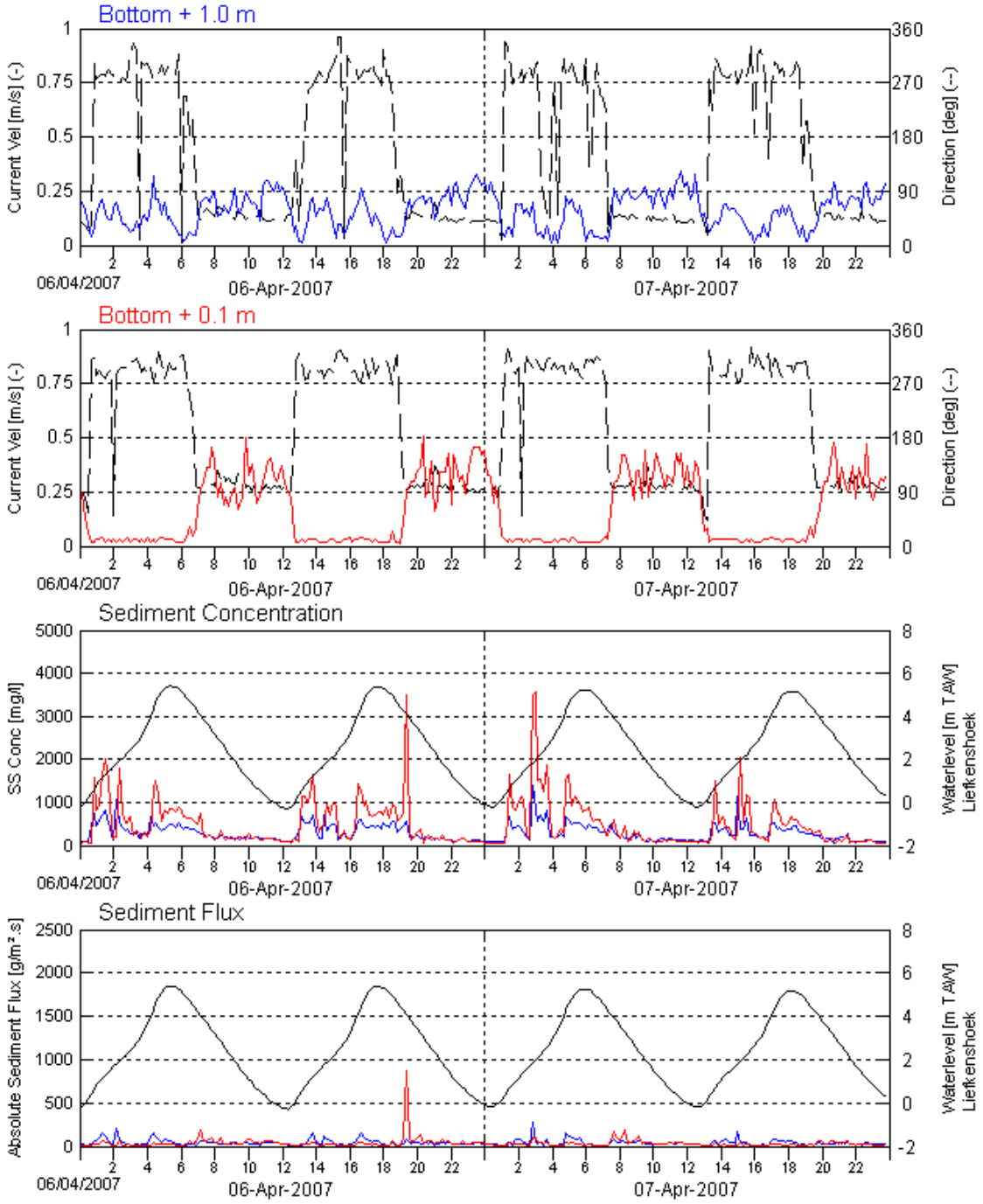
11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:	Date:	
Deurganckdok CDW	04/04/2007– 05/04/2007	*Data processed by:* IMDC *In association with:* WL | delft hydraulics, GEMS International *I/RA/11283/06.123MSA*

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok CDW

Date: 06/04/2007– 07/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

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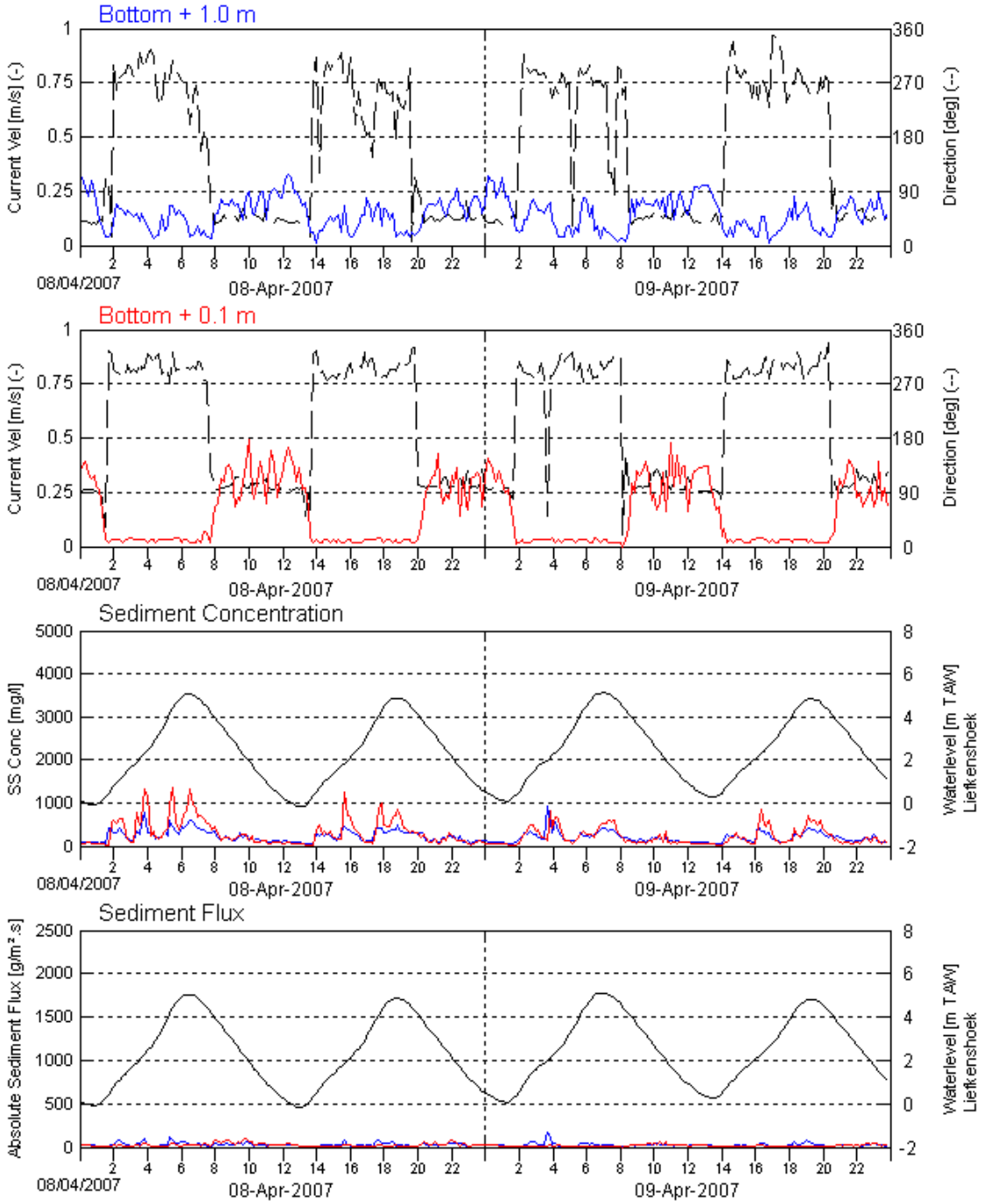
11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok CDW

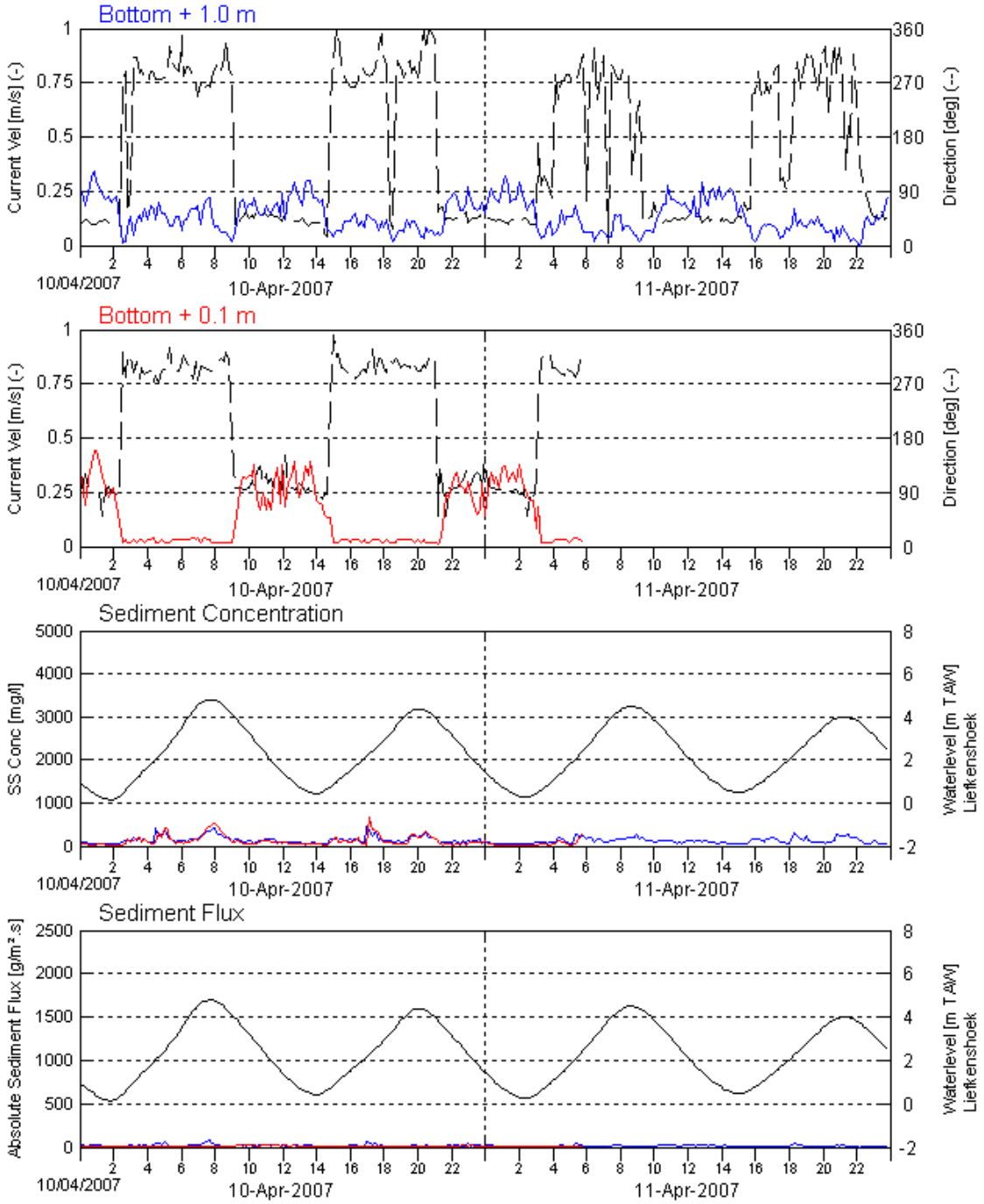
Date: 08/04/2007– 09/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok CDW

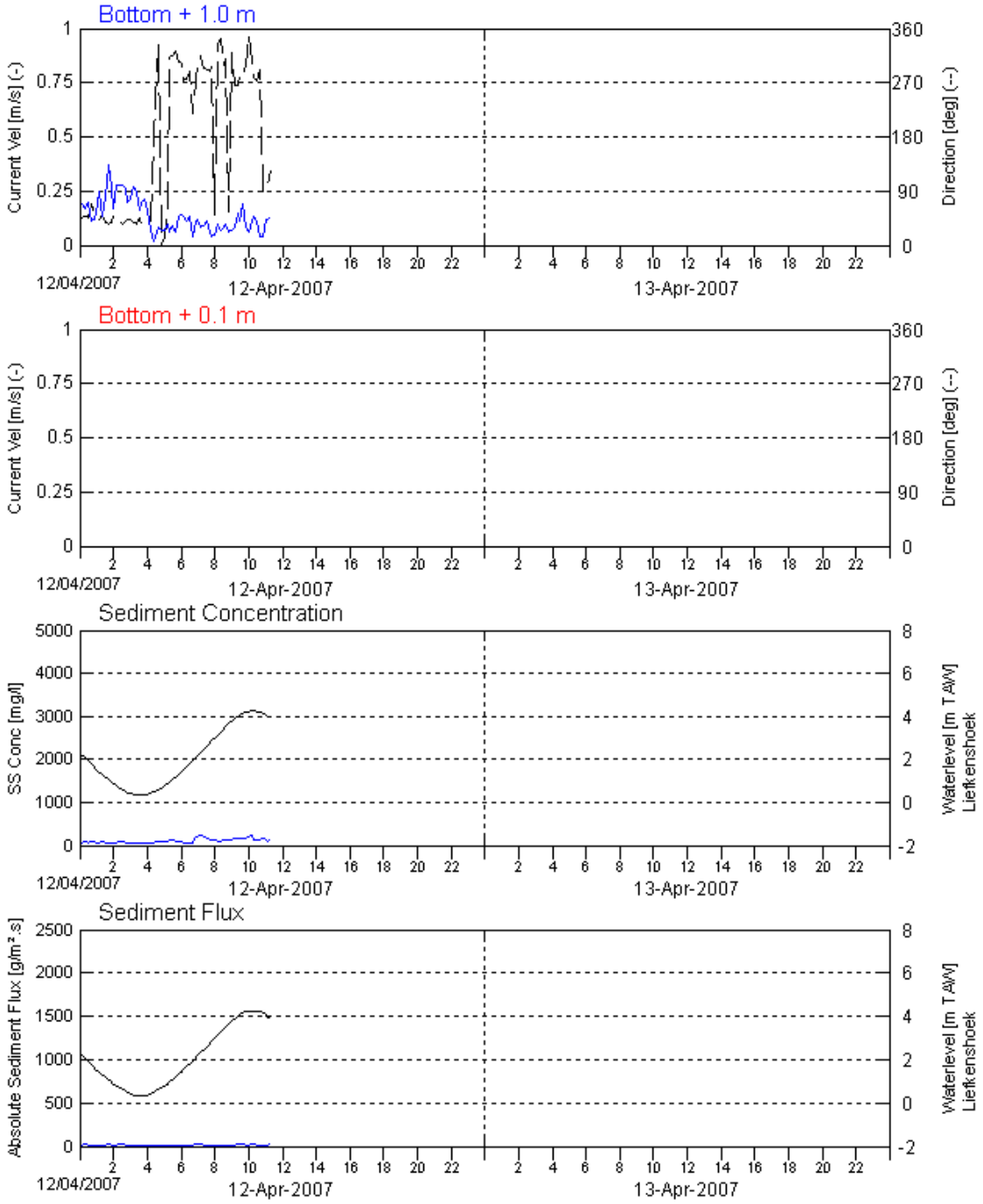
Date:
10/04/2007– 11/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok CDW

Date: 12/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070315	1	ebb	4.2	0.4	262	0.2	308.2	90.5	67.9	29	14.7
20070316	1	flood	4.4	0.3	137.6	0.2	153.3	114.9	135.7	33.5	33.2
20070316	2	ebb	4.2	0.3	284.3	0.2	294.5	92.7	63.7	29.8	12.7
20070316	2	flood	4.6	0.3	146.4	0.2	145	157.2	214.2	46	54.3
20070316	3	ebb	5	0.4	271.2	0.3	301.7	122.2	117.4	42.9	25.6
20070317	3	flood	5.1	0.3	139.4	0.3	156.8	203.7	394.1	66.6	99.5
20070317	4	ebb	4.4	0.4	283.2	0.2	316.6	138.1	140.3	43	27.1
20070317	4	flood	5.3	0.3	143	0.3	150.1	172	273	57.3	75.6
20070317	5	ebb	5.8	0.4	245.3	0.3	289.8	166.1	187.9	72.7	57.1
20070318	5	flood	5.5	0.4	158.5	0.3	157.4	229.2	406.2	86.1	134.9
20070318	6	ebb	5.4	0.3	164.8	0.2	189.9	208.6	270.3	53.8	47.4
20070318	6	flood	6.5	0.4	150.5	0.3	157.6	321.9	781.8	145.6	268.3
20070318	7	ebb	5.6	0.4	216.4	0.3	251.4	232.9	310.9	85.4	75.8
20070319	7	flood	5.3	0.3	145.9	0.2	138.8	420.1	996.3	125.4	189.6
20070319	8	ebb	6.4	0.4	251.4	0.3	291.5	239.4	414.8	87.4	92.8
20070319	8	flood	6.2	0.4	145.3	0.3	142.4	314.5	774.5	126.9	227.1
20070319	9	ebb	6.1	0.4	268.9	0.4	279.6	316.8	668.6	108.4	200.8
20070320	9	flood	5.7	0.3	141.7	0.2	142.9	342.8	649.2	107.2	144.1
20070320	10	ebb	6.3	0.4	278.2	0.4	282	244.5	387.2	83.1	93.4
20070320	10	flood	6.7	0.4	142.5	0.3	152.3	322.1	798	122.8	250.5
20070320	11	ebb	6.3	0.4	280.6	0.4	293.1	263.4	432.1	89.9	123.7
20070321	11	flood	6.1	0.3	141.8	0.3	139.2	359.3	953.2	126	287
20070321	12	ebb	6.7	0.4	315.9	0.4	303.8	259.6	404.1	92.6	119
20070321	12	flood	6.7	0.4	143.4	0.3	154.2	367.7	1044.5	149.1	323.4

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070322	13	ebb	6.6	0.4	292.3	0.4	298.4	338.3	693.2	126	209.4
20070322	13	flood	6.5	0.4	144	0.3	152.6	391.2	1017.7	160.4	332.4
20070322	14	ebb	6.5	0.4	296.3	0.4	308.9	312.4	637.2	126.1	194.2
20070322	14	flood	6.6	0.4	143.8	0.3	142.5	404	1076.2	171.6	399.9
20070323	15	ebb	6.3	0.4	261.3	0.4	304.4	346.2	1131.3	126.9	292.7
20070323	15	flood	6.2	0.4	149.2	0.2	159.2	398.3	1261.6	148.1	295.6
20070323	16	ebb	6.5	0.4	301.5	0.3	245.7	265.8	456.7	100	87
20070323	16	flood	6	0.4	152.5	0.3	154.7	314.7	715.9	124.8	234.4
20070324	17	ebb	5.9	0.4	274.6	0.4	289.3	326.1	658.5	105.6	176
20070324	17	flood	5.7	0.3	159	0.3	146.1	357.5	849.2	126	252.6
20070324	18	ebb	5.8	0.4	258.9	0.4	307.4	292.2	504.6	99.9	147.4
20070324	18	flood	5.5	0.3	143.3	0.3	149.6	336.9	726.7	125.9	233.7
20070326	19	ebb	5.4	0.4	233	0.3	250.6	243.2	475.8	79.9	126.8
20070326	19	flood	4.8	0.3	149.6	0.3	147.6	233.7	595	75.8	123.3
20070326	20	ebb	4.5	0.3	276.2	0.3	292.9	251.9	462.1	75.6	130.2
20070326	20	flood	4.2	0.3	142.2	0.2	156.4	250.9	447.9	74.7	104
20070327	21	ebb	4.2	0.4	274.8	0.3	291.3	166.7	218.7	54.5	60.1
20070327	21	flood	4.4	0.3	161.1	0.3	164	222.8	392.1	67.6	106.7
20070327	22	ebb	4	0.3	235.6	0.3	292.1	179.9	330.2	50.2	93.8
20070327	22	flood	3.6	0.3	151	0.2	142.7	184.9	295.4	50.8	70
20070328	23	ebb	3.9	0.3	251.2	0.3	300.4	134.4	152.6	41.1	40
20070328	23	flood	4.3	0.3	152.8	0.2	161.4	185.4	328.2	53.9	71.4
20070328	24	ebb	4	0.4	146.6	0.3	132.8	162.4	235.8	49.6	58.6
20070329	24	flood	4	0.3	148.9	0.2	143.7	244.9	533.9	70.2	129.6

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070329	25	ebb	4.3	0.4	180.5	0.3	127.1	162	260.2	56.2	75.2
20070329	25	flood	4.8	0.3	156.9	0.3	158.8	387.5	1026.2	131.9	263.7
20070329	26	ebb	4.6	0.4	144.3	0.3	110.7	192.5	524.5	66.6	111.1
20070330	26	flood	4.4	0.3	159.4	0.3	169.7	380.5	1075	126.6	297.2
20070330	27	ebb	4.9	0.4	121.2	0.4	112.8	180.7	514	66.8	123.7
20070330	27	flood	5.1	0.3	158.2	0.3	159.9	480.8	1379.9	161.5	357.4
20070330	28	ebb	4.9	0.4	173.2	0.4	119.5	215.9	2576.4	75.1	619.4
20070331	28	flood	4.8	0.3	143	0.3	164.4	412.8	1647.5	138.7	410.3
20070331	29	ebb	5.3	0.4	144.3	0.4	119.6	217	2273	74.1	904.8
20070331	29	flood	5.5	0.3	147.8	0.3	156.6	394.3	1261.6	139.6	327.9
20070331	30	ebb	5.2	0.4	149.7	0.4	116.7	242.9	1073.1	86.9	-33.7
20070401	30	flood	5.1	0.3	146.7	0.3	157.9	402.3	1229.2	130.9	276
20070401	31	ebb	5.6	0.5	143	0.4	94.4	199.2	481.1	78.2	147.5
20070401	31	flood	5.7	0.4	148.8	0.3	158.6	351.1	315.6	134	-6.5
20070401	32	ebb	5.5	0.4	177.4	0.3	117.8	267.4	235.8	87.1	-36.2
20070402	32	flood	5.6	0.3	146.6	0.3	145.1	366.3	22.4	129	-51.5
20070402	33	ebb	5.7	0.4	154.2	0.4	87.3	202.8	22.5	72.8	-57.4
20070402	33	flood	5.9	0.4	149.2	0.3	148.4	292.6	22.5	110	-106.9
20070402	34	ebb	5.5	0.4	182.2	0.3	124.5	242	22.6	90.6	-521.5
20070403	34	flood	5.6	0.3	151	0.3	160.3	364.6	22.6	126	-90.8
20070403	35	ebb	5.8	0.4	124.6	0.4	94.7	217.6	22.3	81.6	-503.3
20070403	35	flood	6	0.4	146.5	0.3	155	301.7	22.7	113.1	-147.3
20070403	36	ebb	5.7	0.4	152.4	0.4	94.4	244.7	22.7	87.1	-59.6
20070404	36	flood	5.6	0.3	152.6	0.3	153.2	420.8	22.6	149.7	-73.3

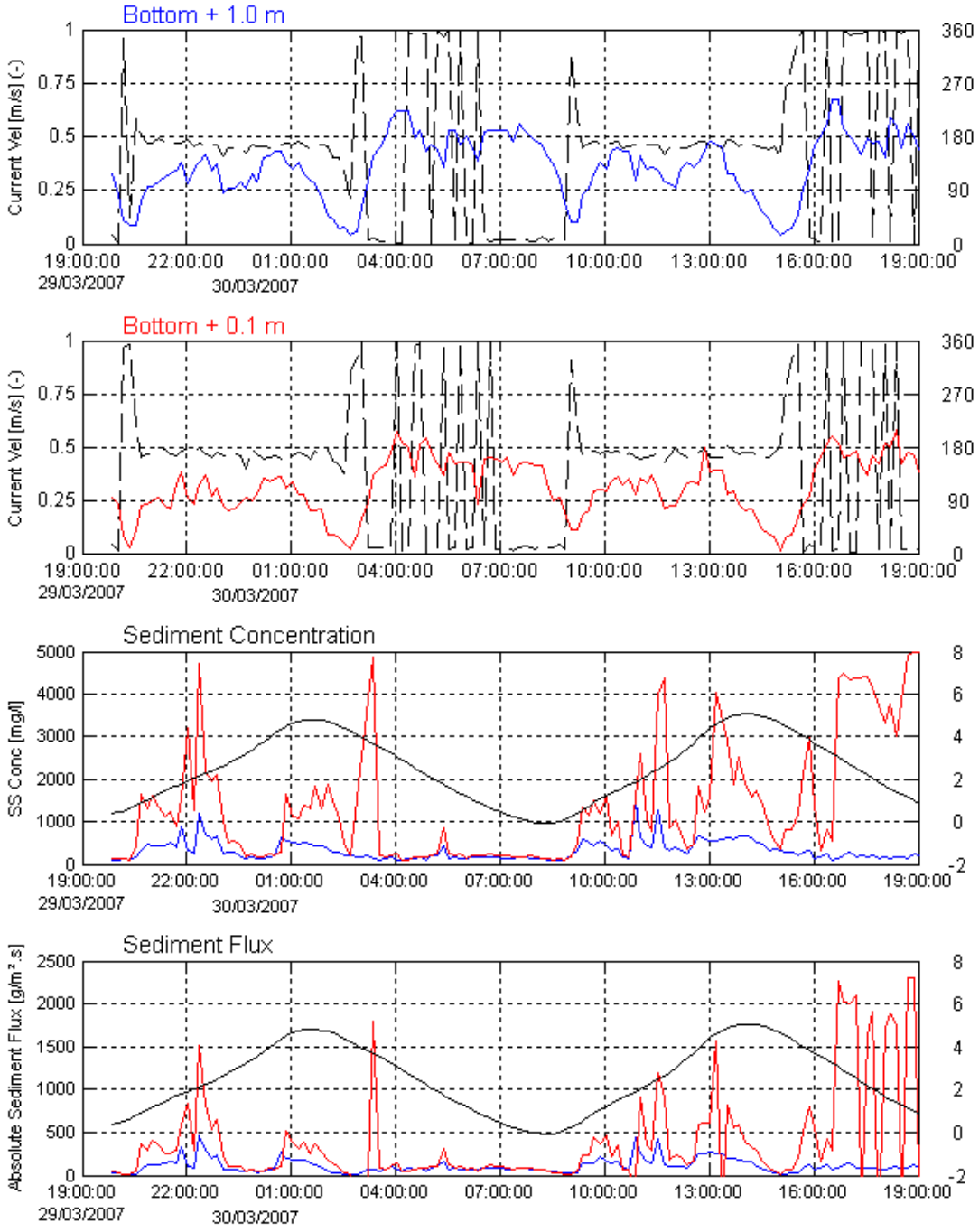
RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070404	37	ebb	5.9	0.5	184.1	0.4	135	218.4	22.4	83.2	-42.9
20070404	37	flood	5.9	0.3	149.9	0.3	148.3	367.5	22.7	136.1	-133.8
20070404	38	ebb	5.7	0.4	213.4	0.4	179.9	271.1	209.5	97.7	-113.2
20070405	38	flood	5.7	0.3	148.6	0.3	159.1	341.7	22.8	125.5	-90.7
20070405	39	ebb	5.8	0.4	192.3	0.4	151.6	212.7	22.3	81.3	-55.6
20070405	39	flood	5.8	0.3	121.7	0.3	150	339.3	717.3	124.8	278.1
20070406	40	ebb	5.7	0.2	46.5	0.3	102.7	229.7	321.4	42.5	70.5
20070406	40	flood	5.5	0.1	248.7	0	267	409.5	710.7	60.8	20.4
20070406	41	ebb	5.7	0.2	83.7	0.2	137.8	225.7	301.5	32.5	48.4
20070406	41	flood	5.5	0.1	248	0	286	373.9	661.3	51.2	18.8
20070407	42	ebb	5.5	0.2	79.2	0.3	136.8	215.3	357.6	30.6	61.7
20070407	42	flood	5.4	0.1	226.6	0	272.6	426.4	972.7	53.8	26.5
20070407	43	ebb	5.4	0.2	80.5	0.3	140	208	252.4	31.6	43.7
20070407	43	flood	5.3	0.1	257.8	0	276.1	335.2	511.4	41.7	14.7
20070408	44	ebb	5.3	0.2	76.4	0.3	134.7	163.6	175.4	25.5	27.5
20070408	44	flood	5.1	0.1	243.6	0	272.2	309.3	492.7	36.6	14.7
20070408	45	ebb	5.2	0.2	71.8	0.3	131.2	199.2	249.1	28.4	38.1
20070408	45	flood	5	0.1	228.1	0	266.9	237.9	359.3	26.4	10.2
20070409	46	ebb	4.8	0.2	73.5	0.2	139.6	173.8	185	23.9	26.5
20070409	46	flood	5	0.1	239.5	0	269.1	254.7	281.2	32	8
20070409	47	ebb	4.8	0.2	79.2	0.2	133.2	152.4	157.6	20.8	22.4
20070409	47	flood	4.5	0.1	257.4	0	275.3	204.5	248.8	21.8	7.5
20070410	48	ebb	4.7	0.2	79.6	0.2	133.7	148.7	145.9	20.1	18.8
20070410	48	flood	4.6	0.1	252.4	0	278.3	170.1	153.8	23.8	4.5

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070410	49	ebb	4.3	0.2	97.9	0.2	142.4	135.6	120.4	19.3	14.8
20070410	49	flood	3.9	0.1	249.7	0	275.3	158.1	136.1	15.9	4.2
20070411	50	ebb	4.1	0.2	92	0.2	131.7	103.2	80.3	14.8	9.9
20070411	50	flood	4.2	0.1	210.9	0	281.1	129	161.3	11.9	4
20070411	51	ebb	4	0.2	58.7	0	314.3	112	274.7	16.5	5.5
20070411	51	flood	3.5	0.1	238.7	0	314.3	133.4	274.7	11.1	5.5
20070412	52	ebb	3.7	0.2	74	0	314.3	89.9	274.7	11.5	5.5
20070412	52	flood	3.9	0.1	230.6	0	314.3	116.7	274.7	11.1	5.5

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:	Date:
Deurganckdok CDW	Avg Tide 29/03– 30/03

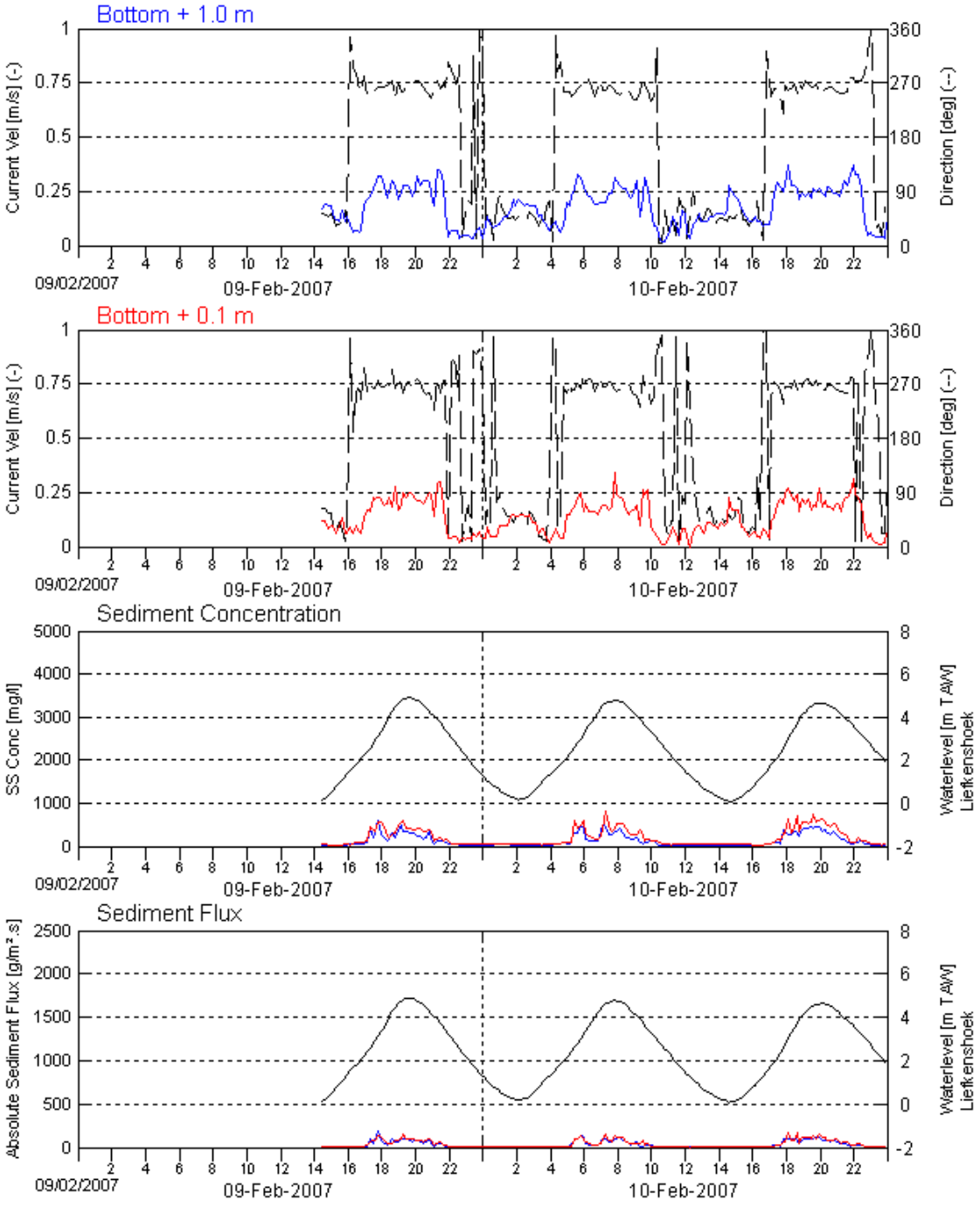
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

D.2 Sill Frame

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

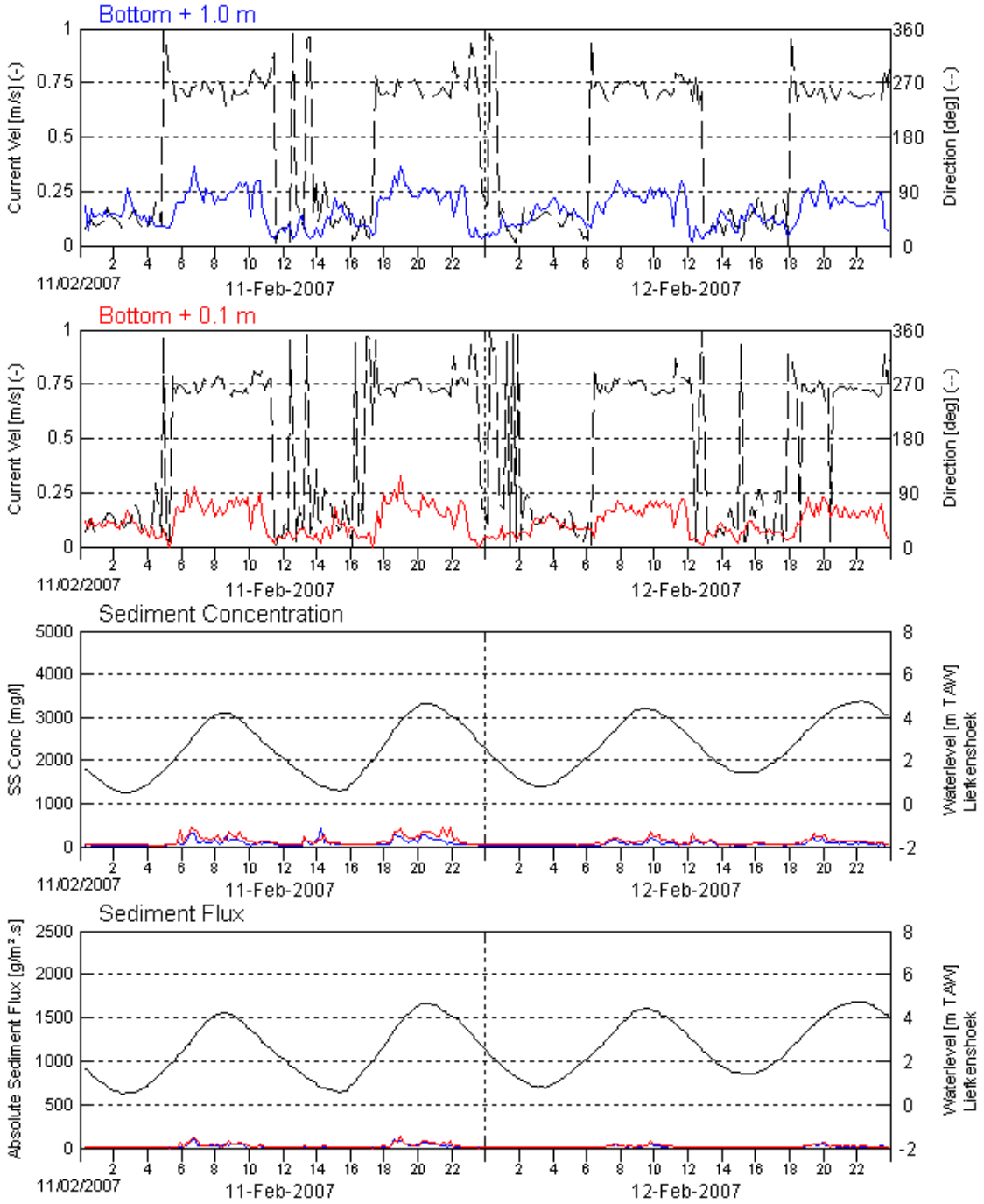
Date: 09/02/2007– 10/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok Sill

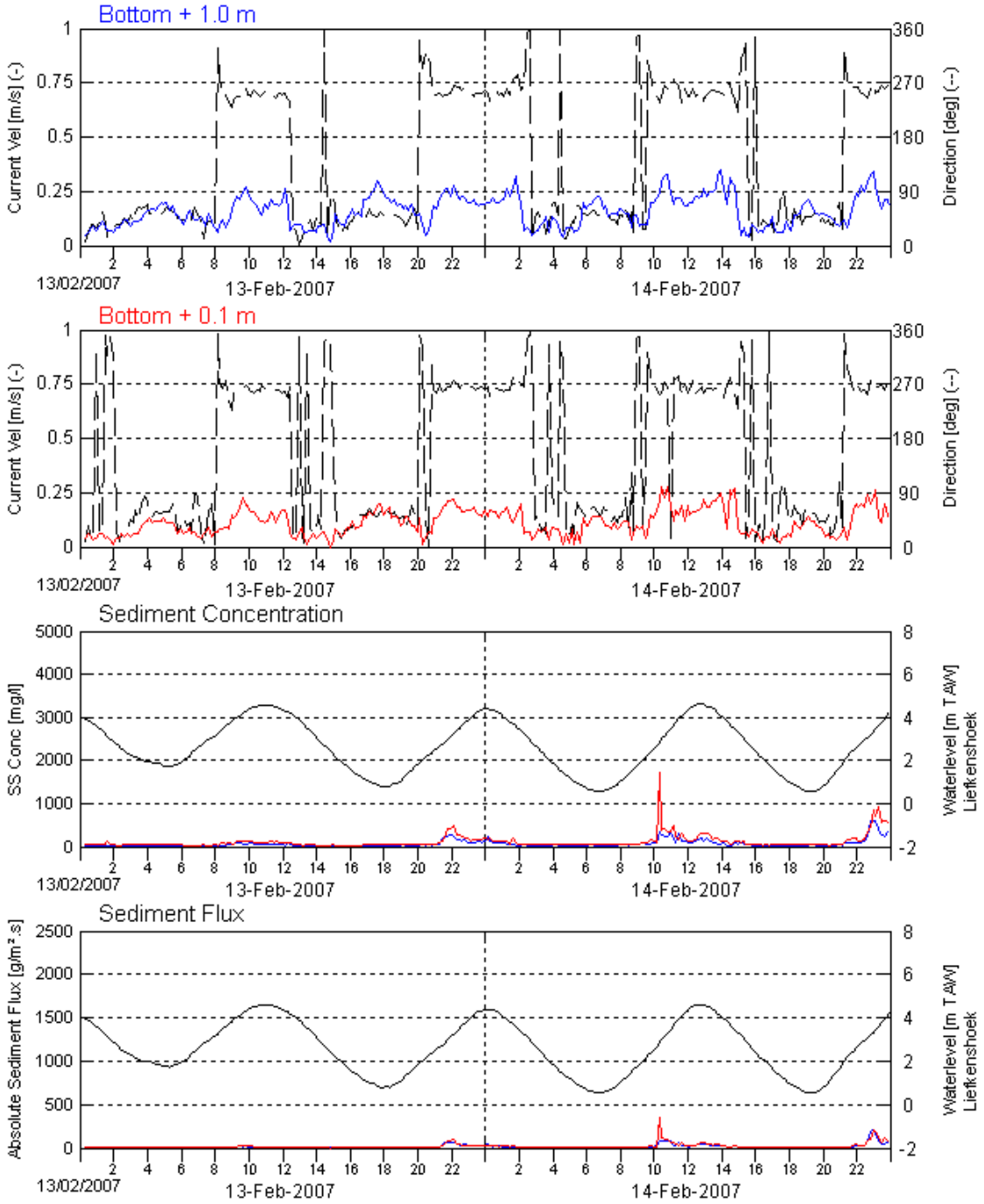
Date:
11/02/2007– 12/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

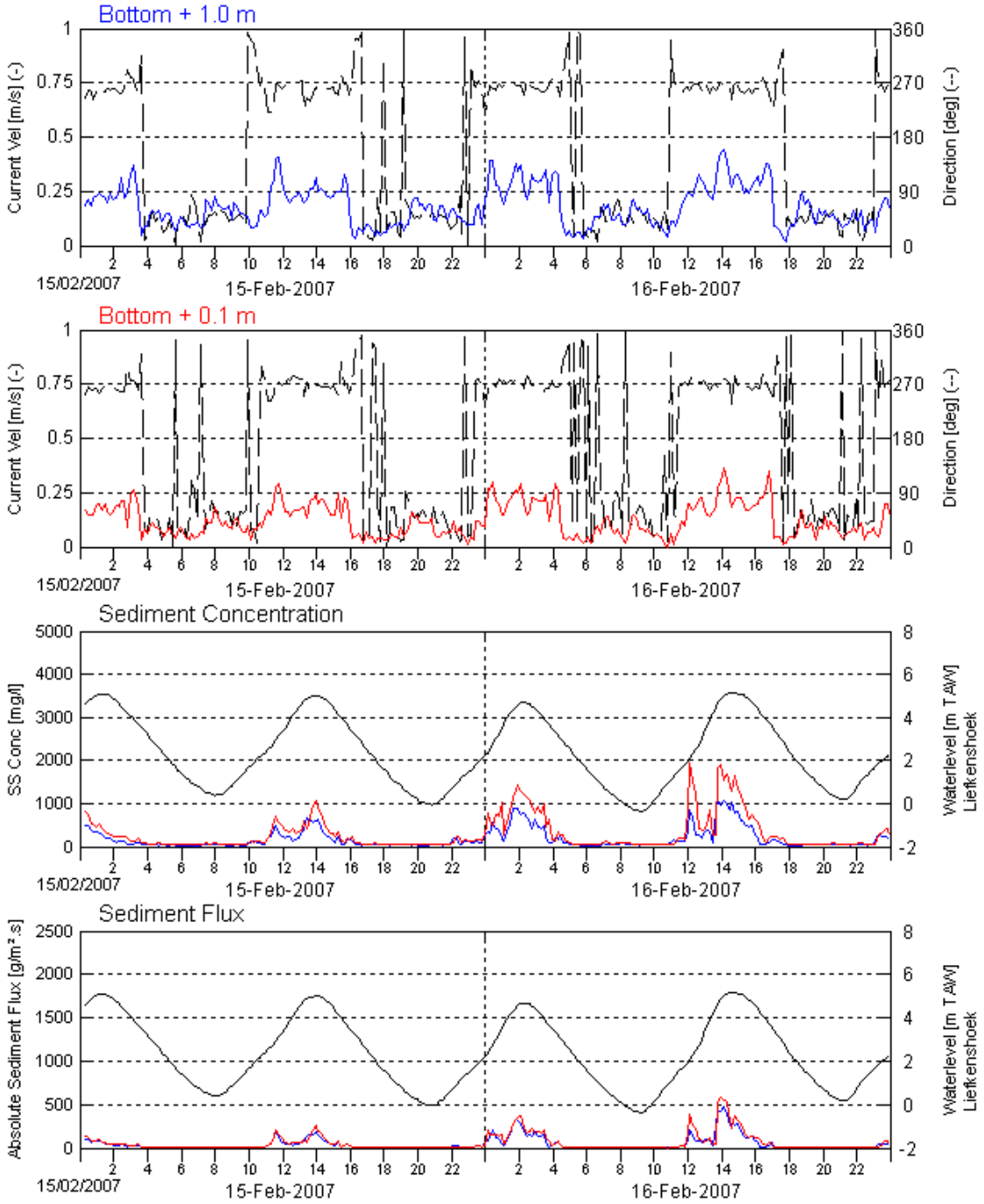
Date: 13/02/2007– 14/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

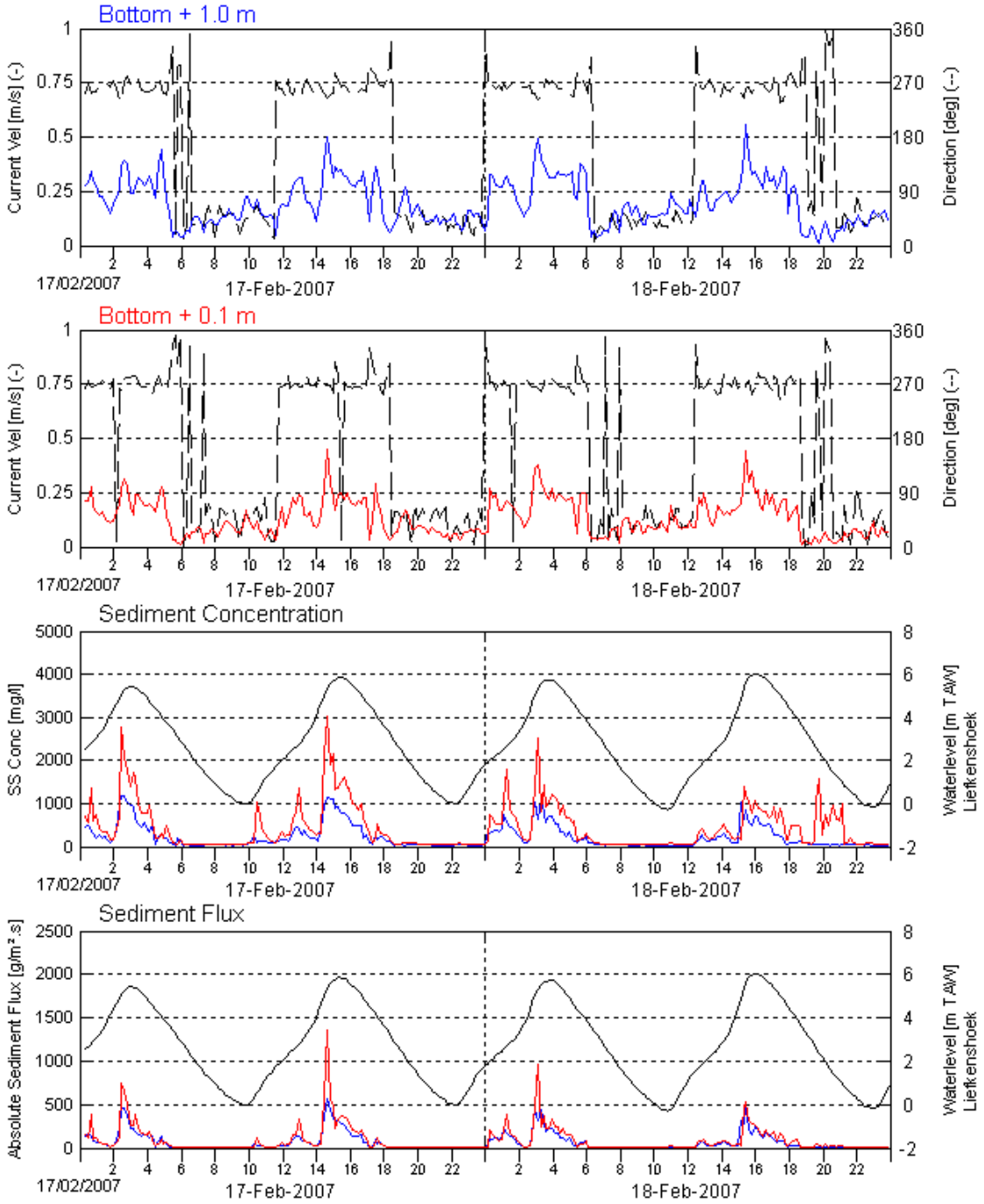
Date: 15/02/2007– 16/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok Sill

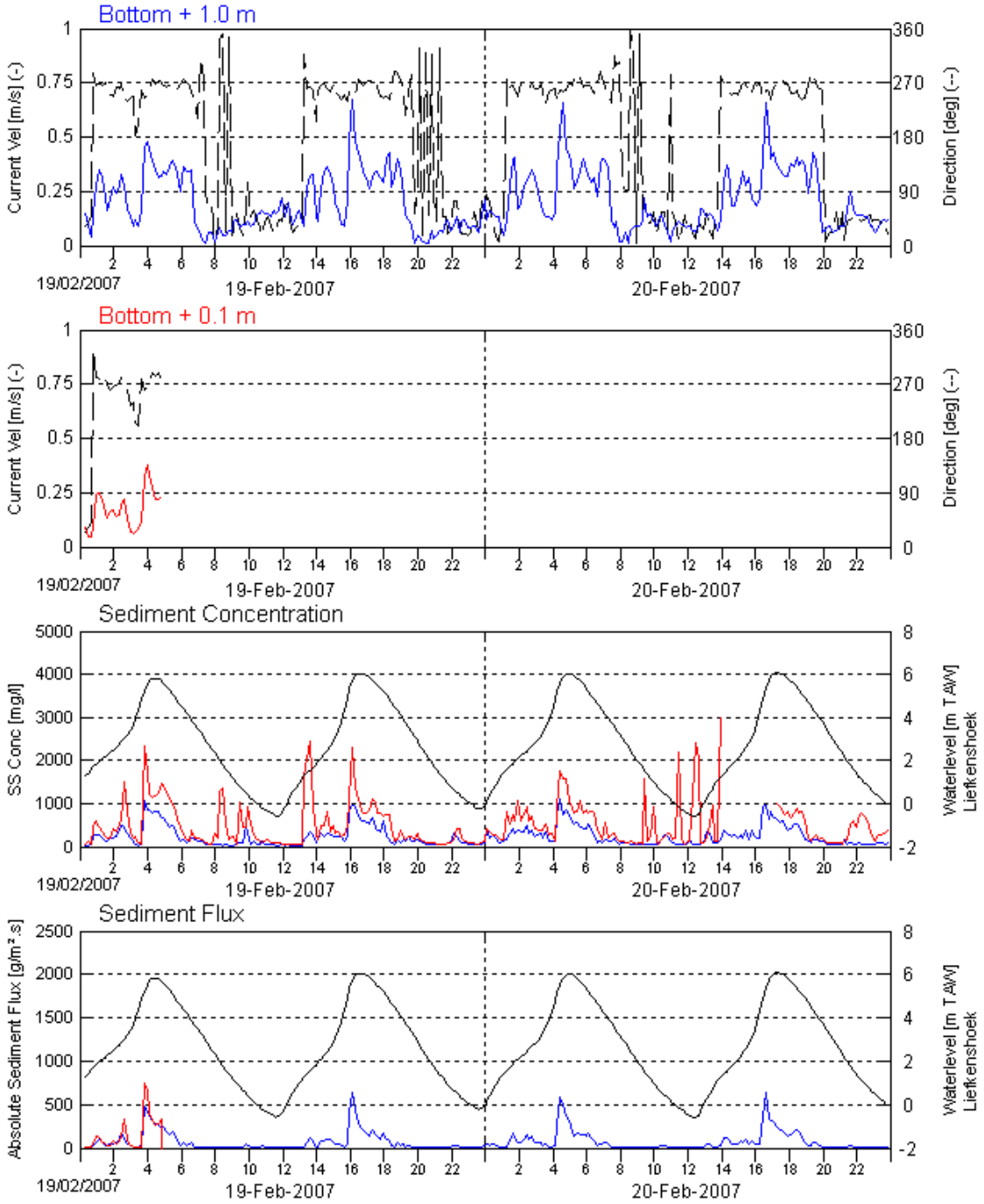
Date:
17/02/2007– 18/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

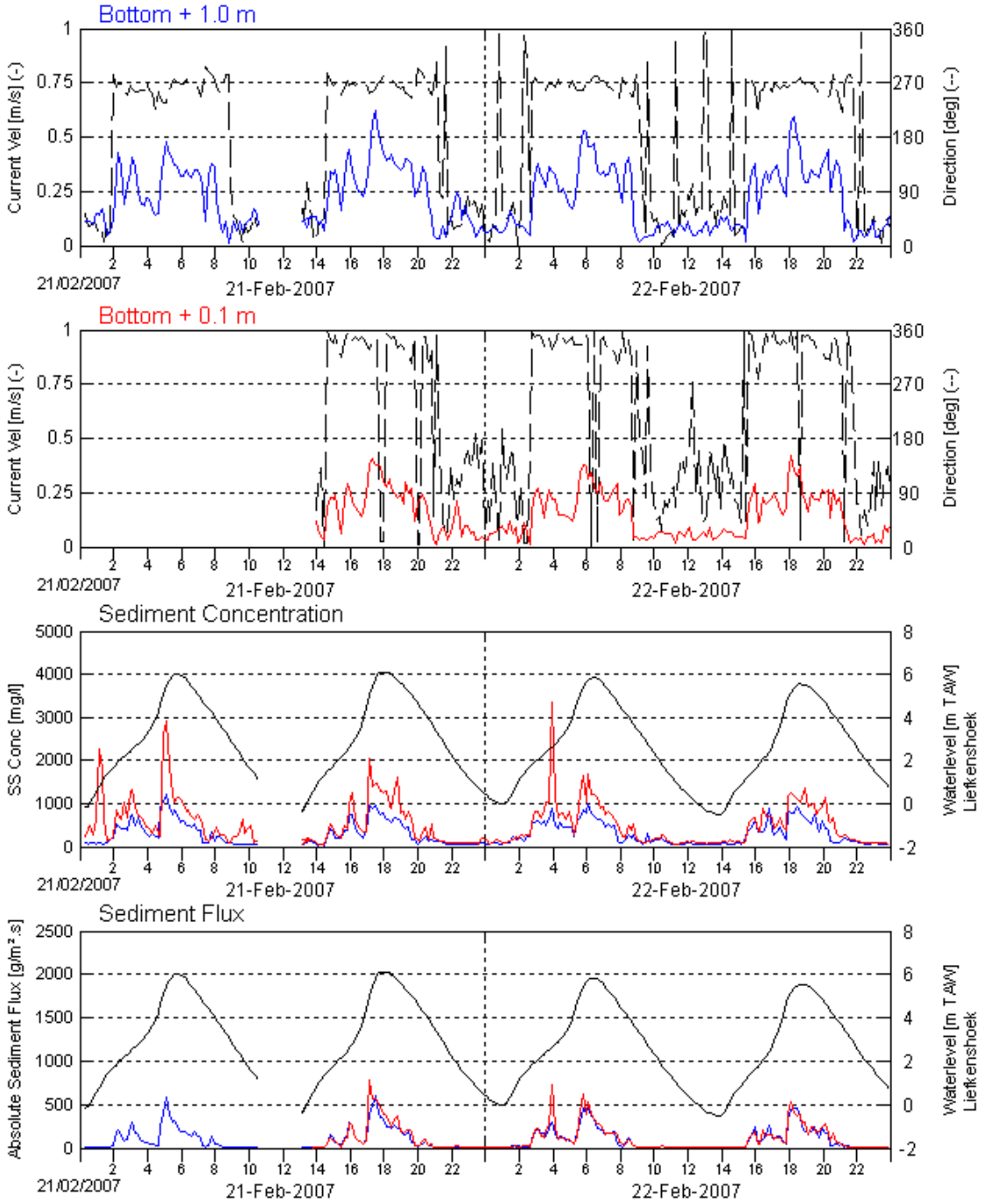
Date: 19/02/2007– 20/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok Sill

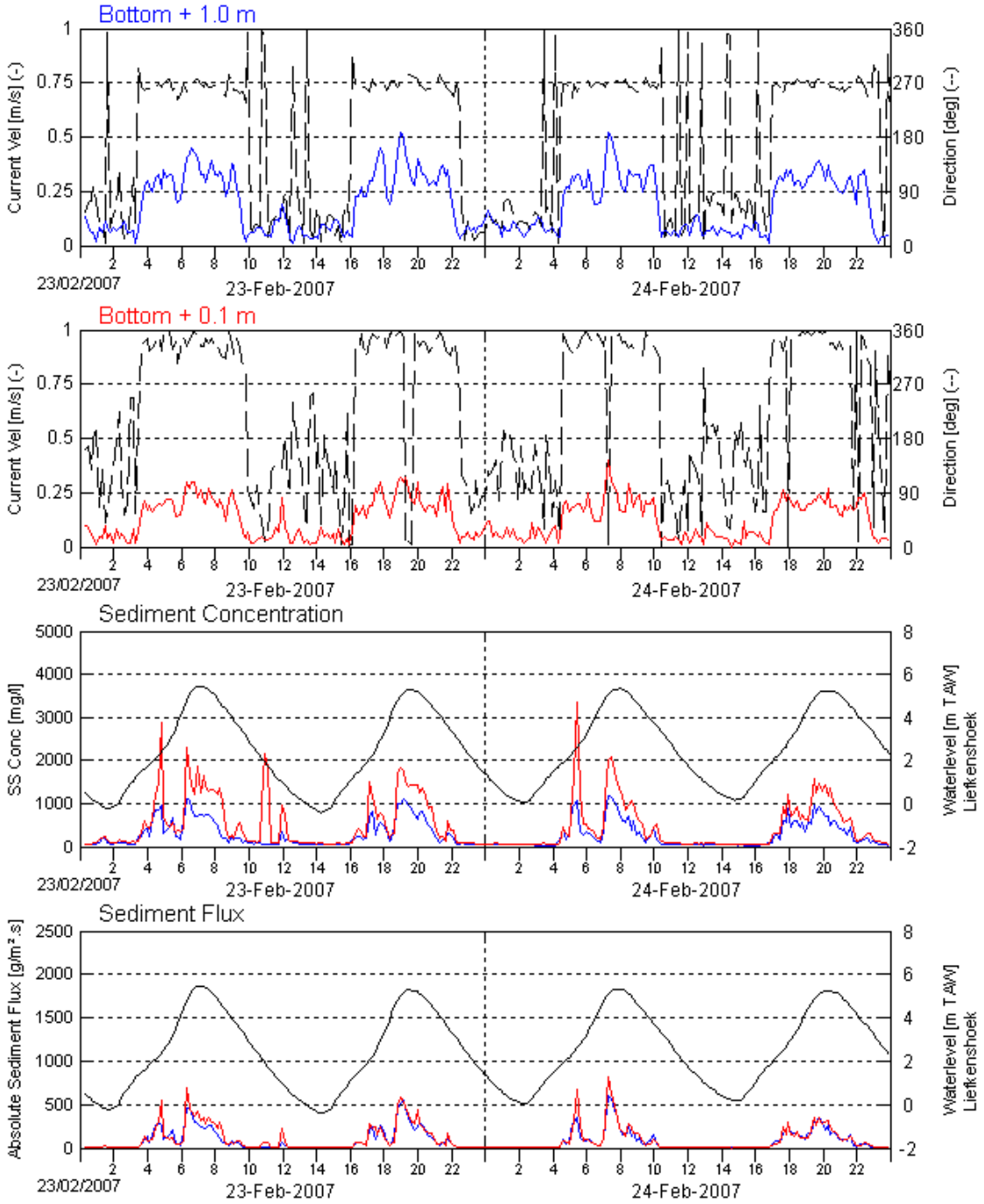
Date:
21/02/2007– 22/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

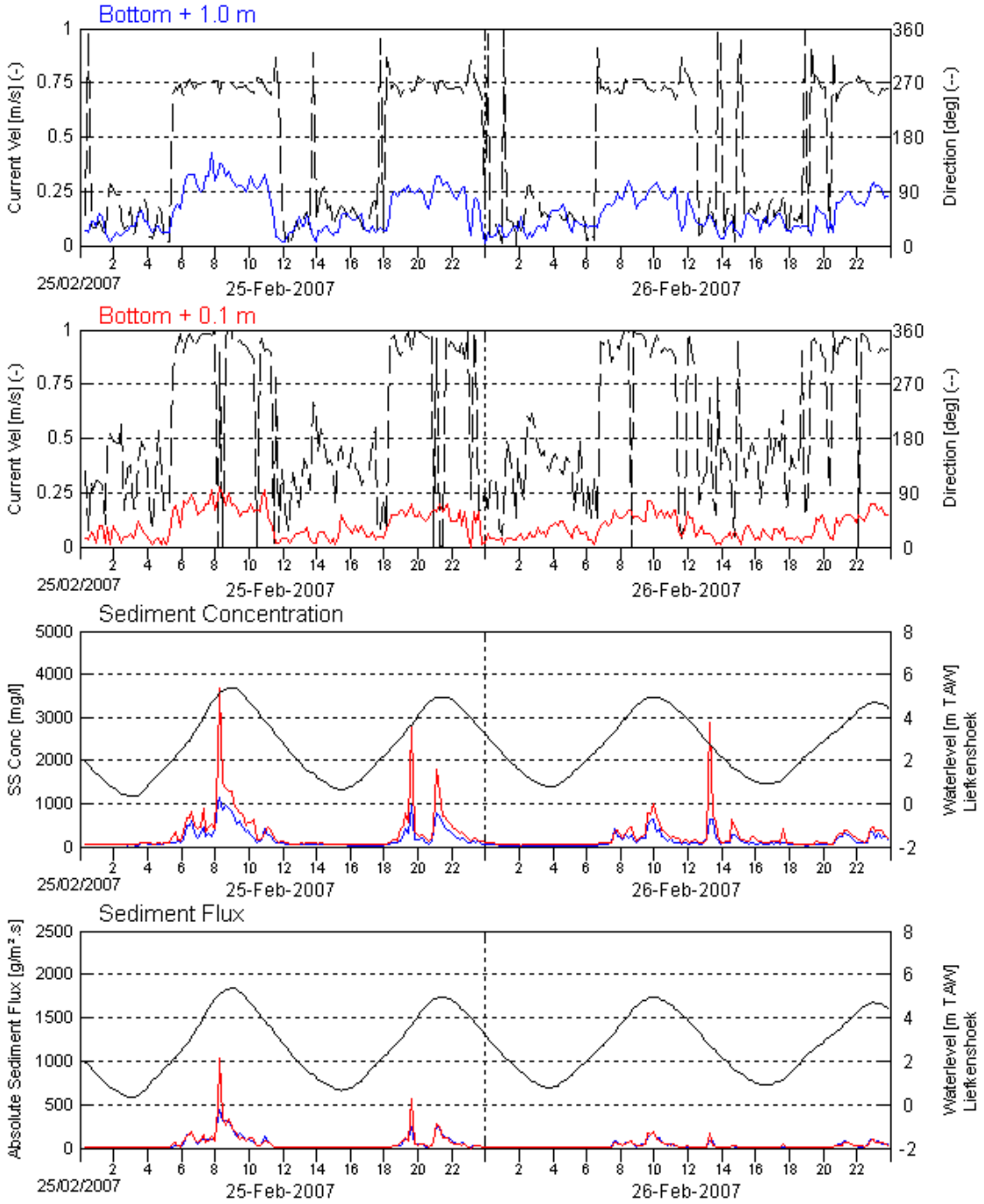
Date: 23/02/2007– 24/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok Sill

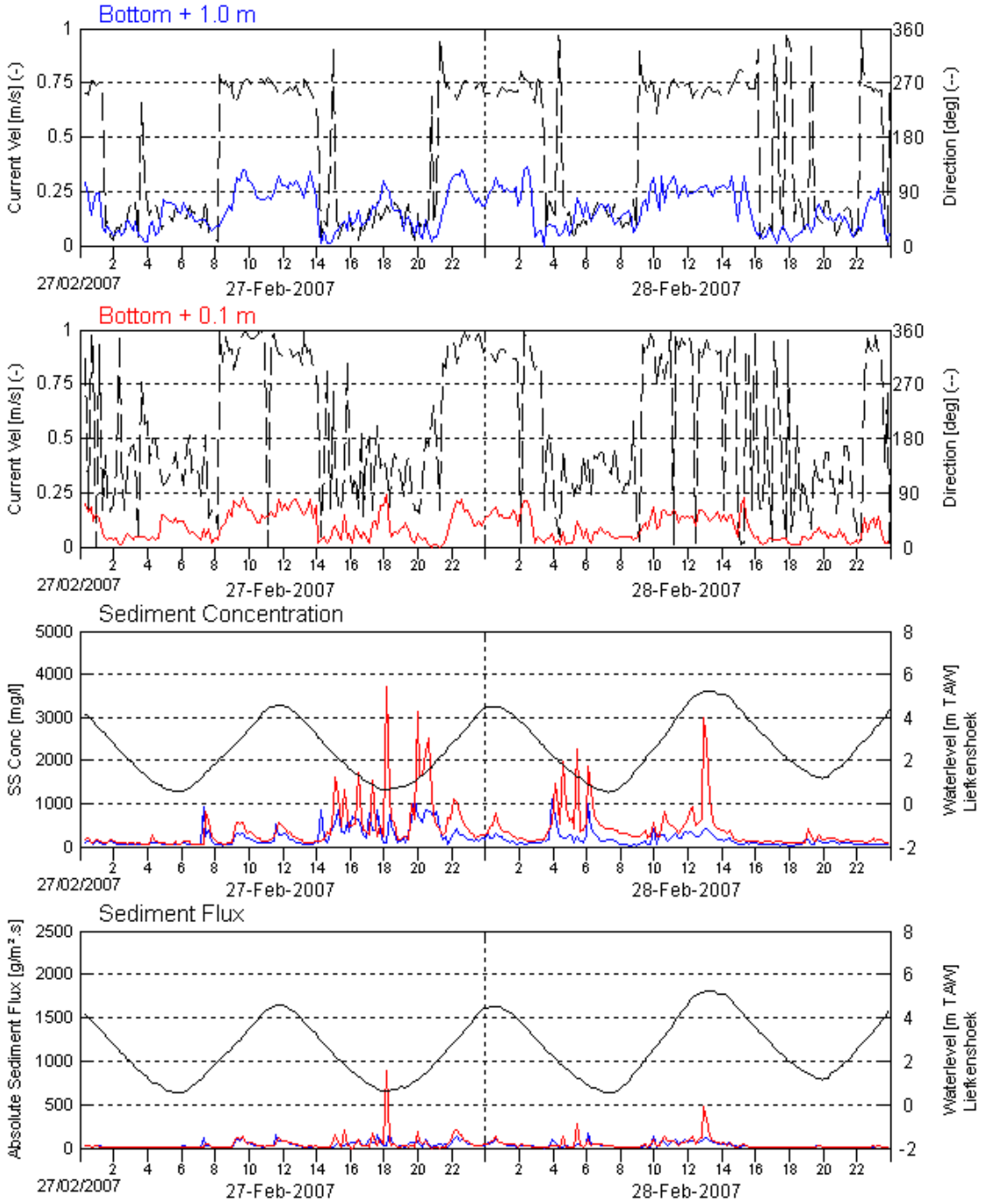
Date:
25/02/2007– 26/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok Sill

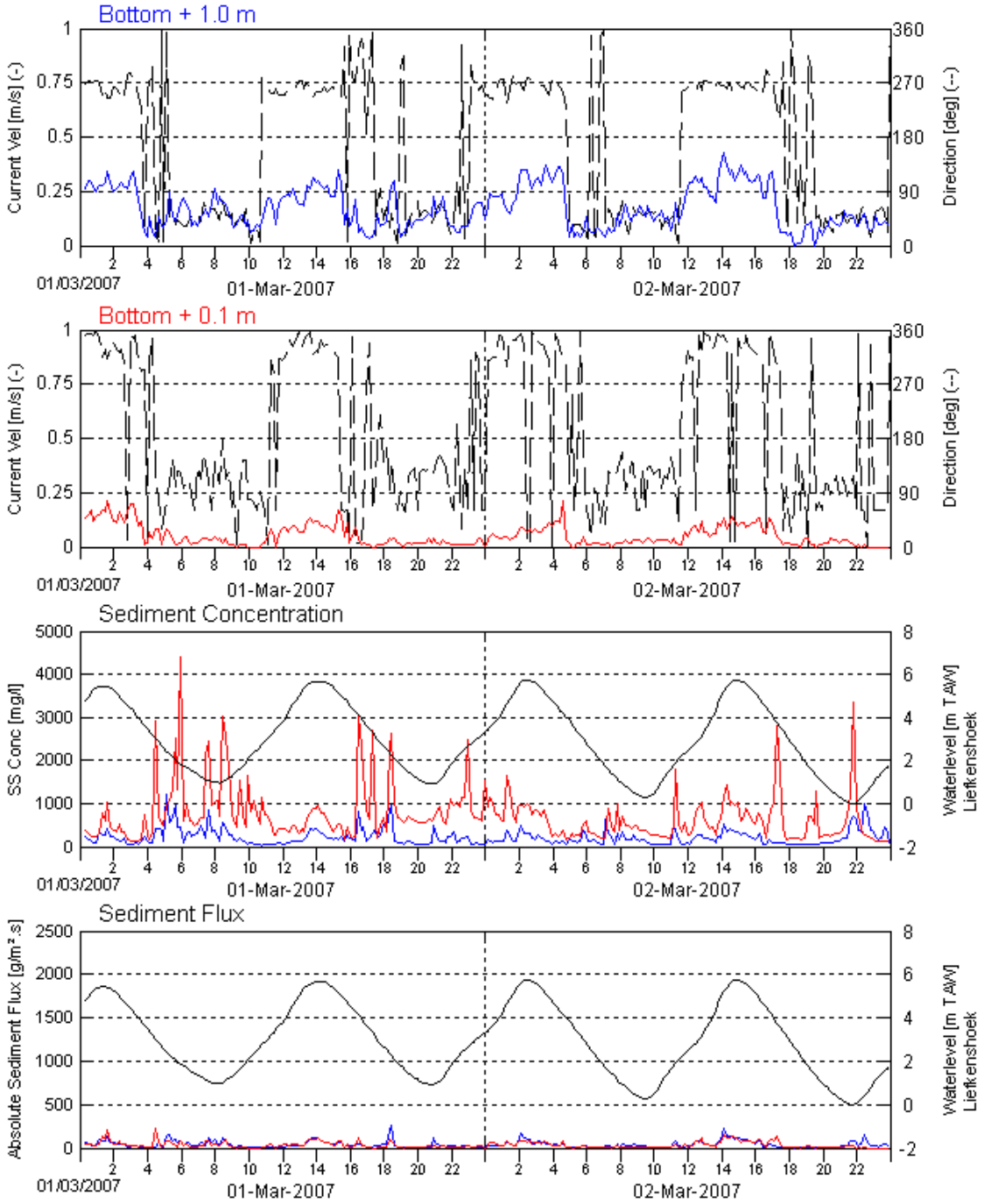
Date:
27/02/2007– 28/02/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok Sill

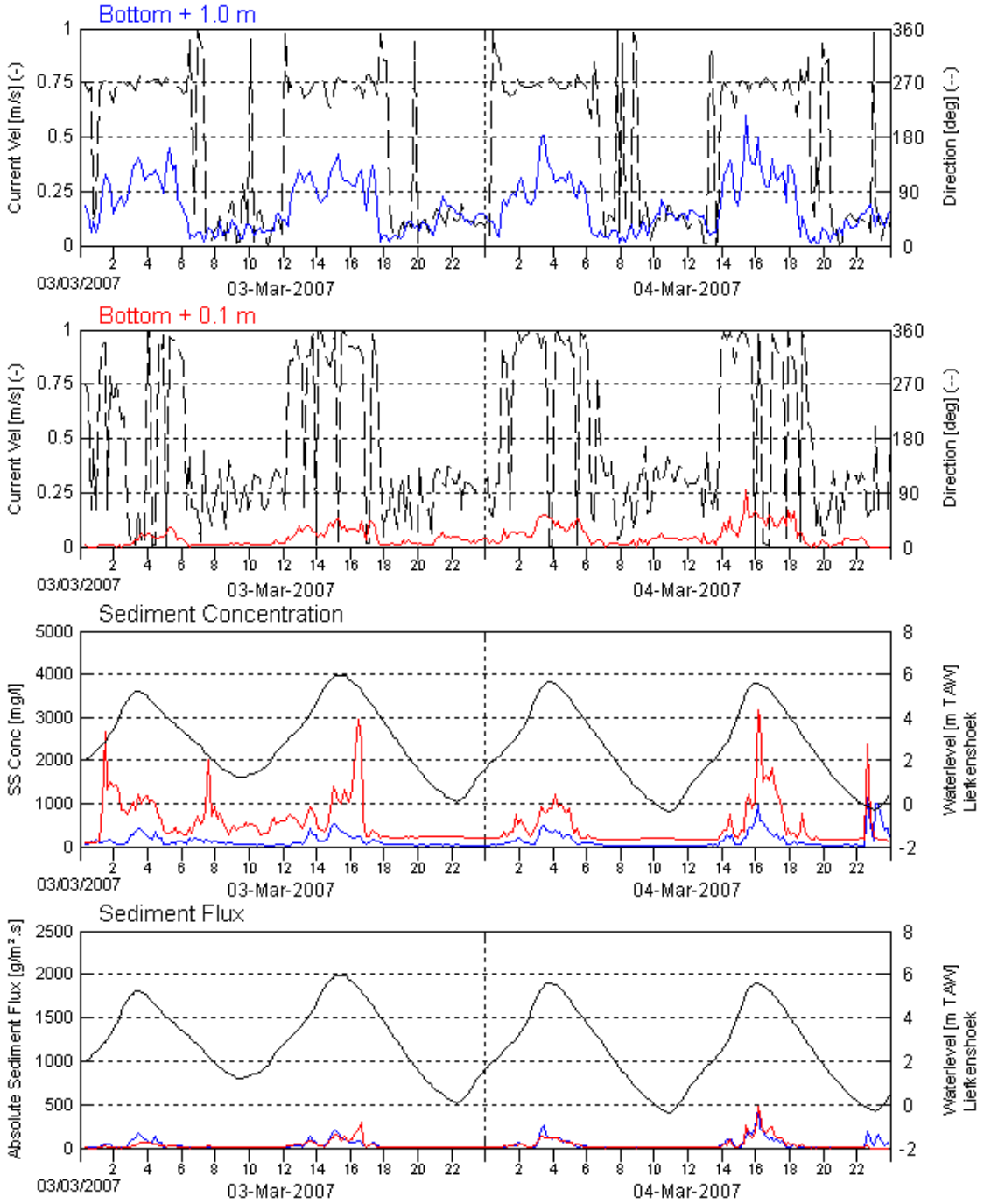
Date:
01/03/2007– 02/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

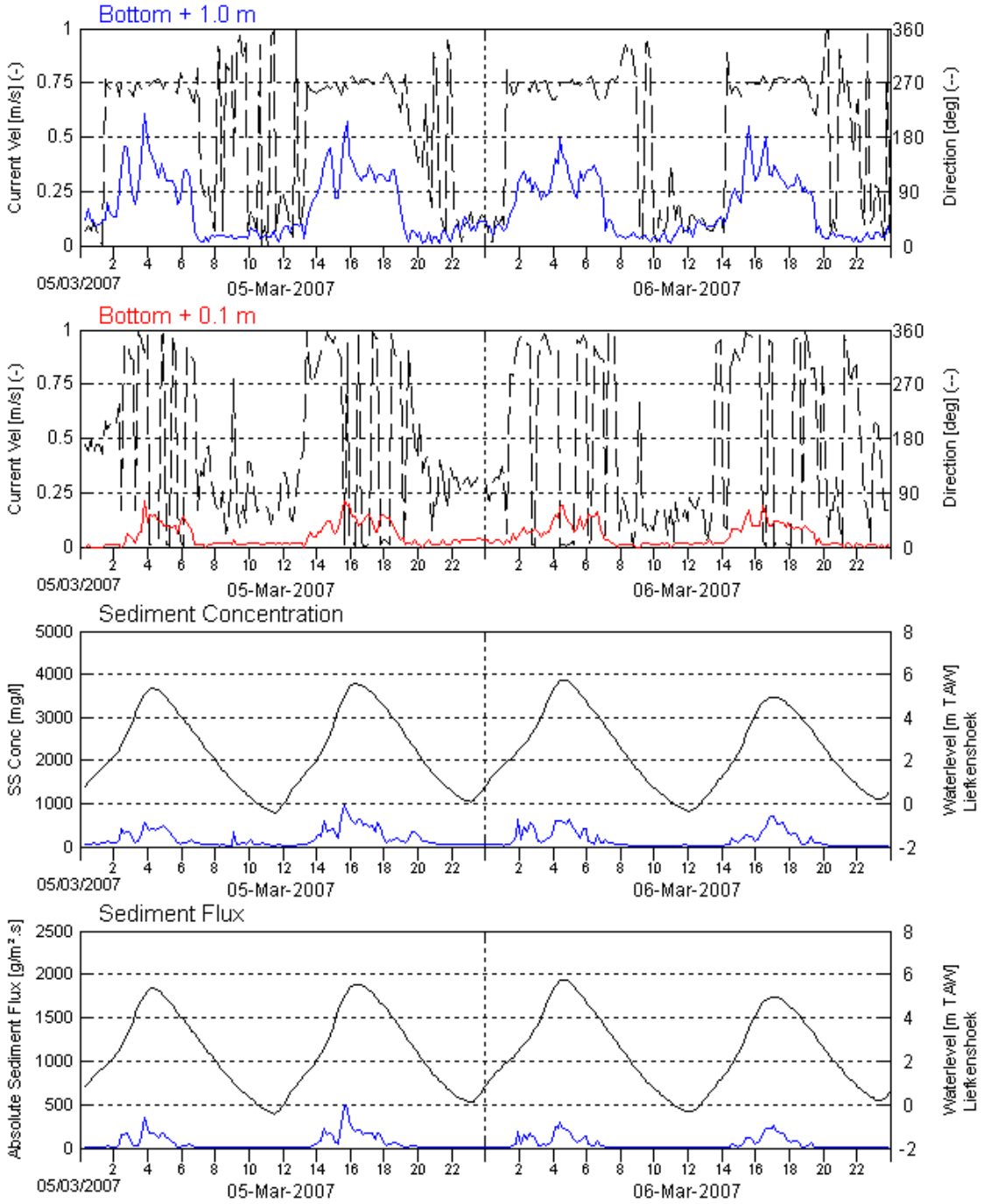
Date: 03/03/2007– 04/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

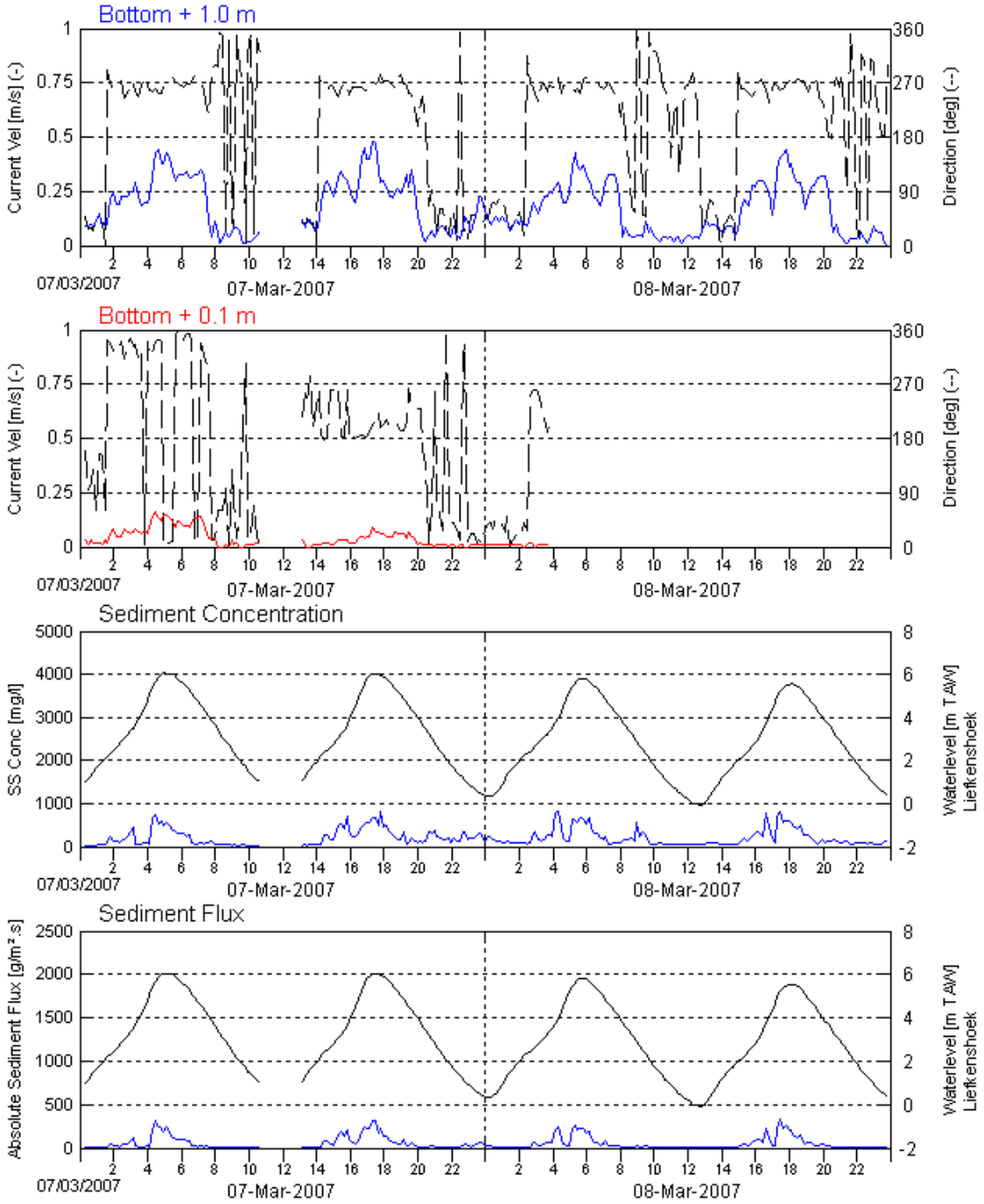
Date: 05/03/2007– 06/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

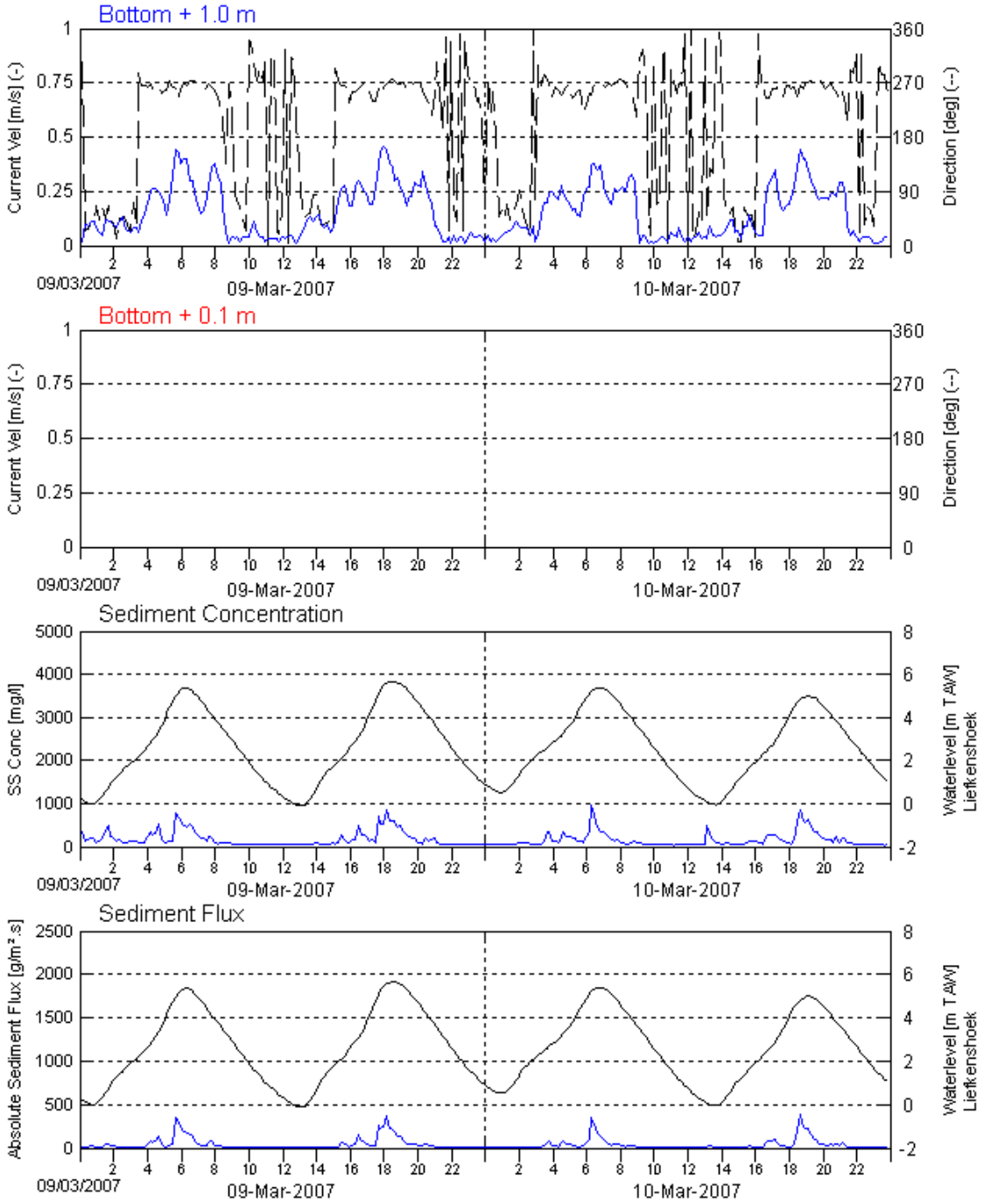
Date: 07/03/2007– 08/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

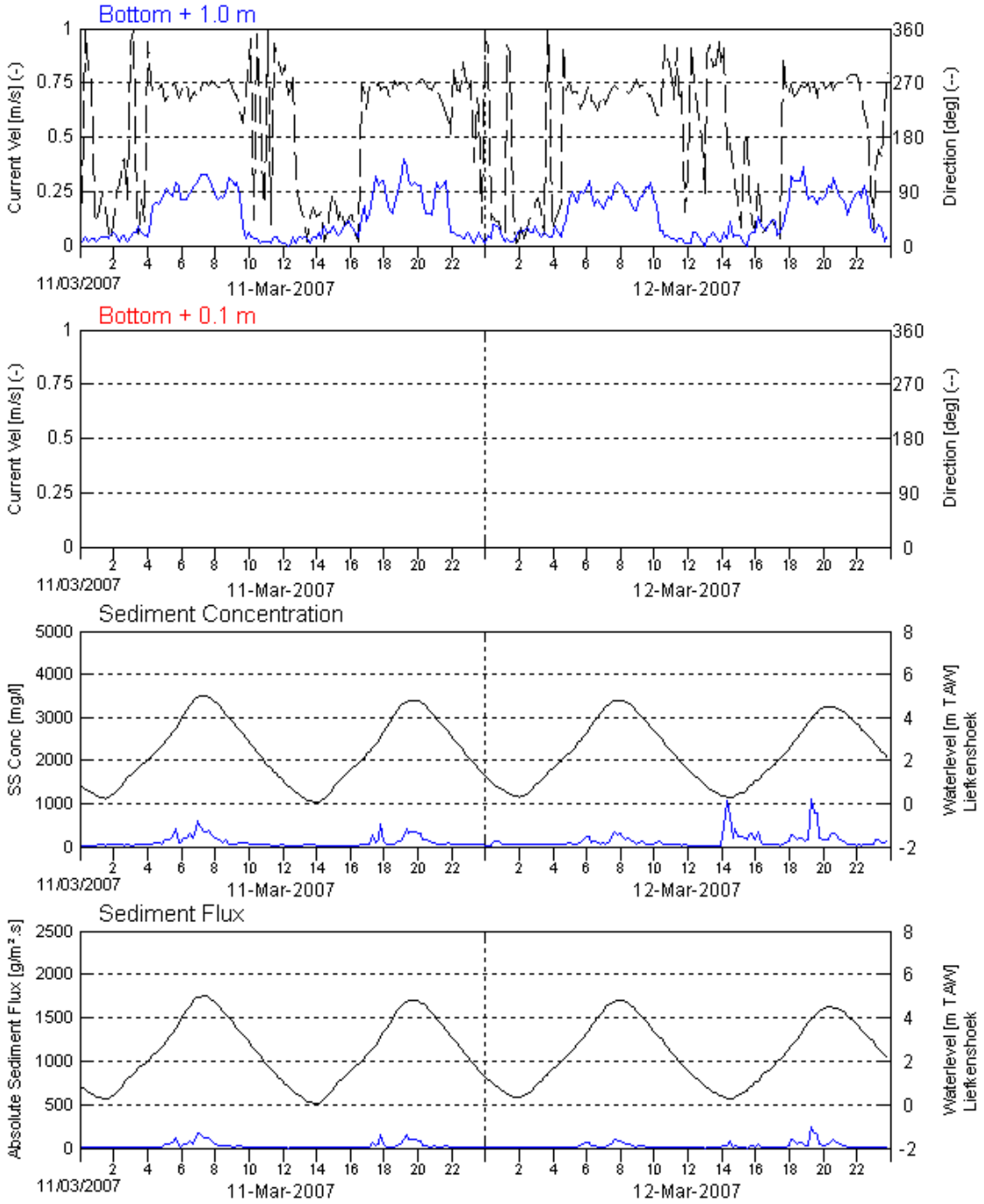
Location:	Date:
Deurganckdok Sill	09/03/2007– 10/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

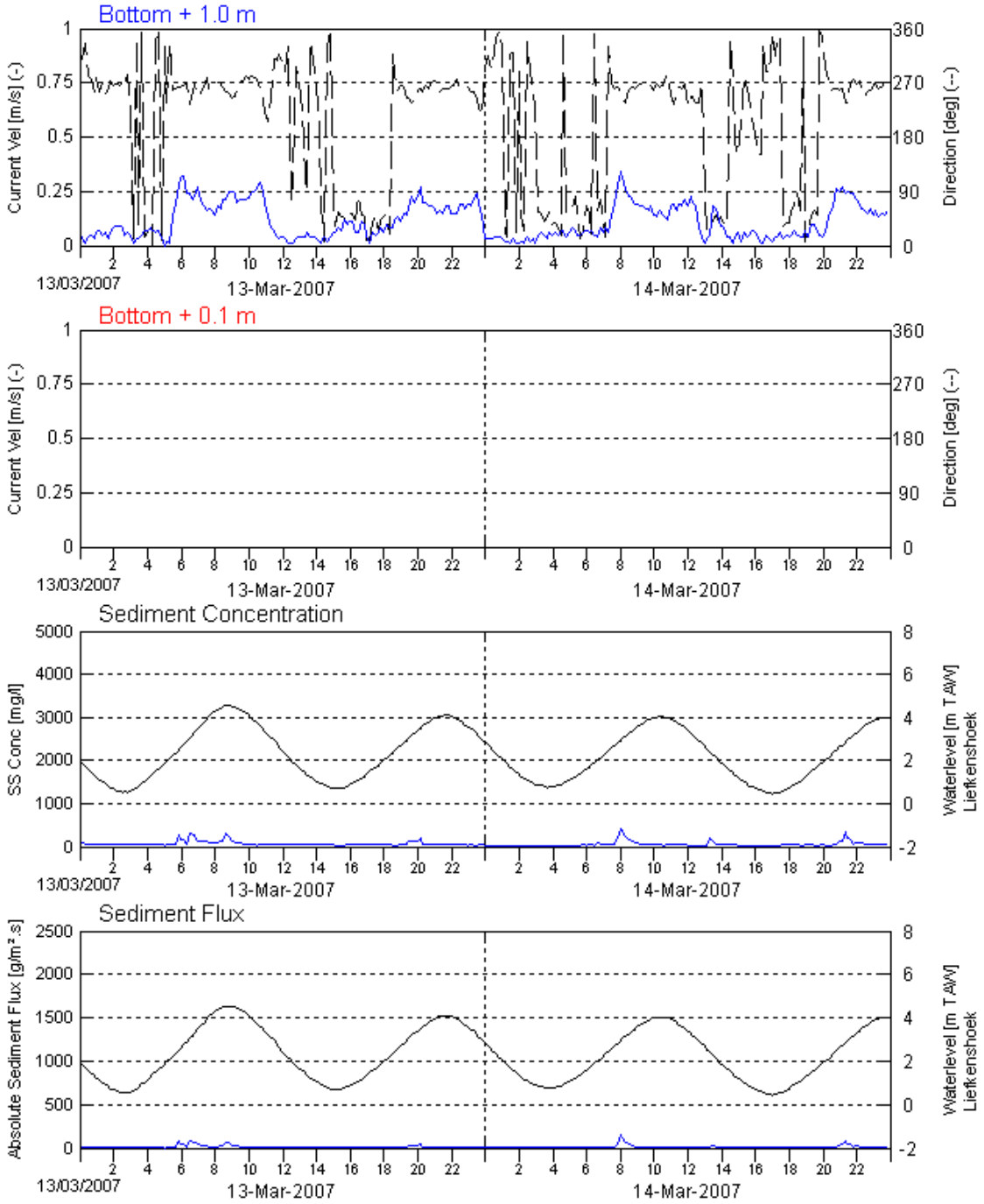
Date: 11/03/2007– 12/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

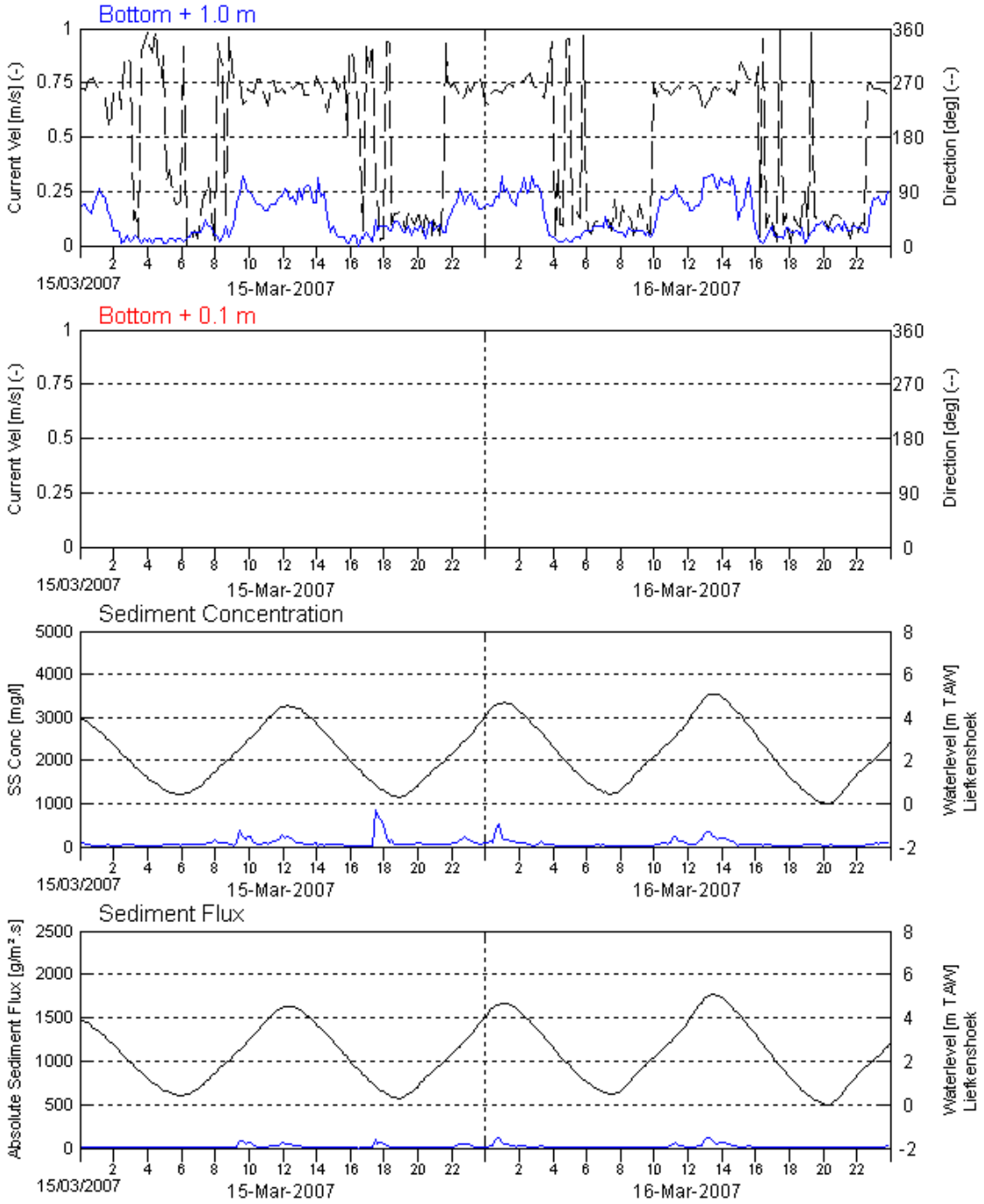
Location:	Date:
Deurganckdok Sill	13/03/2007– 14/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

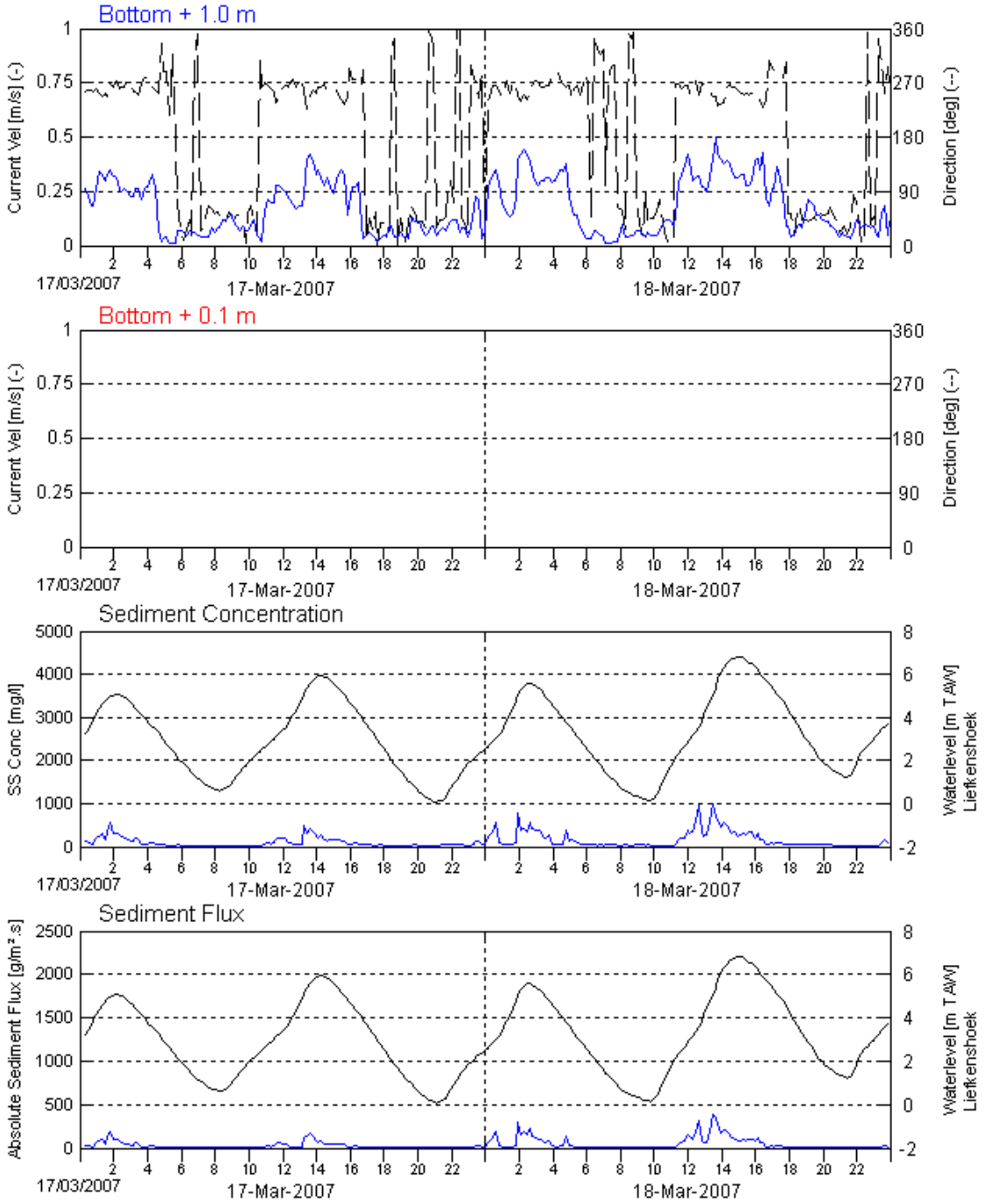
I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel		Data processed by: IMDC
Location: Deurganckdok Sill	Date: 15/03/2007– 16/03/2007	In association with: WL | delft hydraulics, GEMS International
		I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

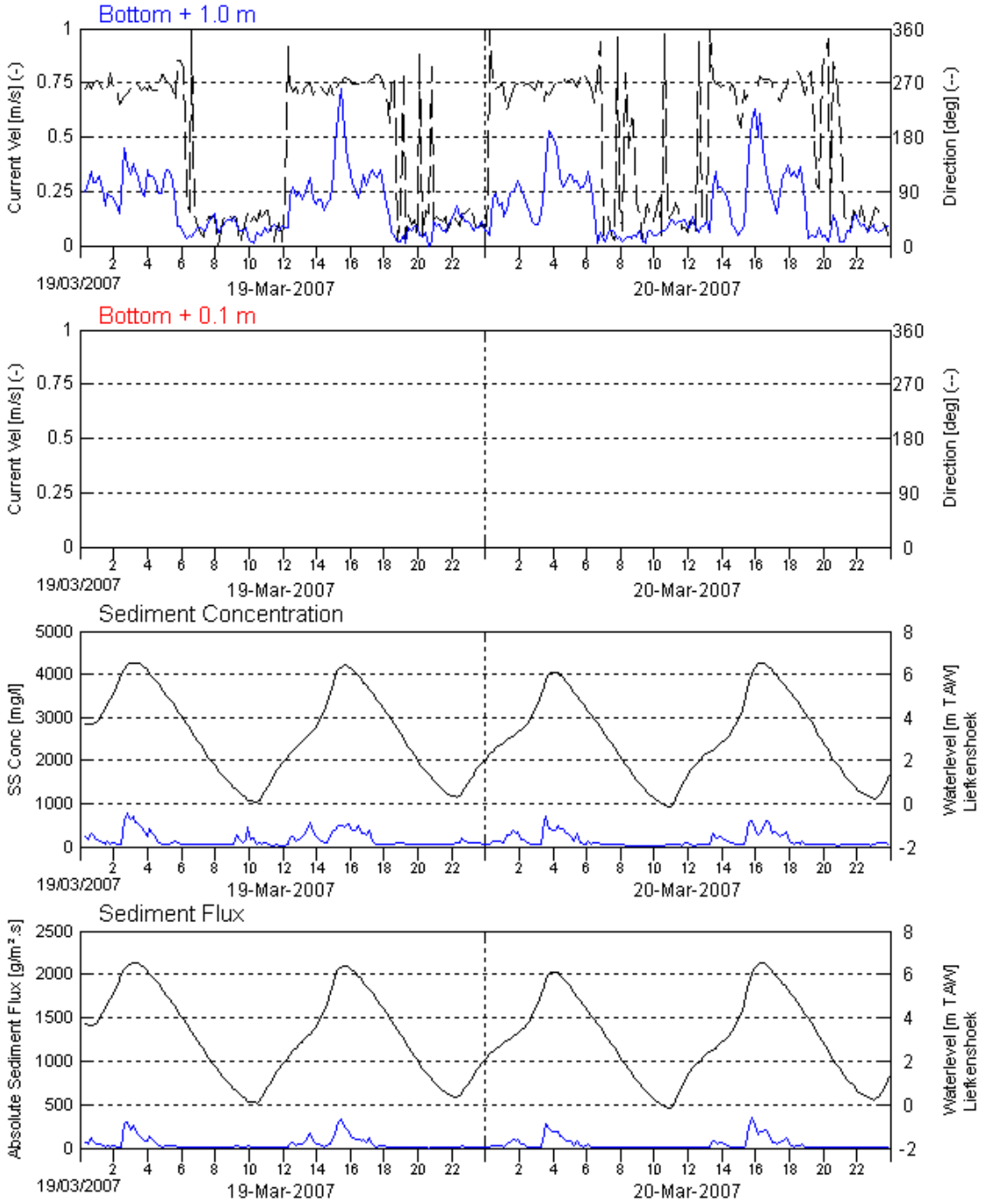
Date: 17/03/2007– 18/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

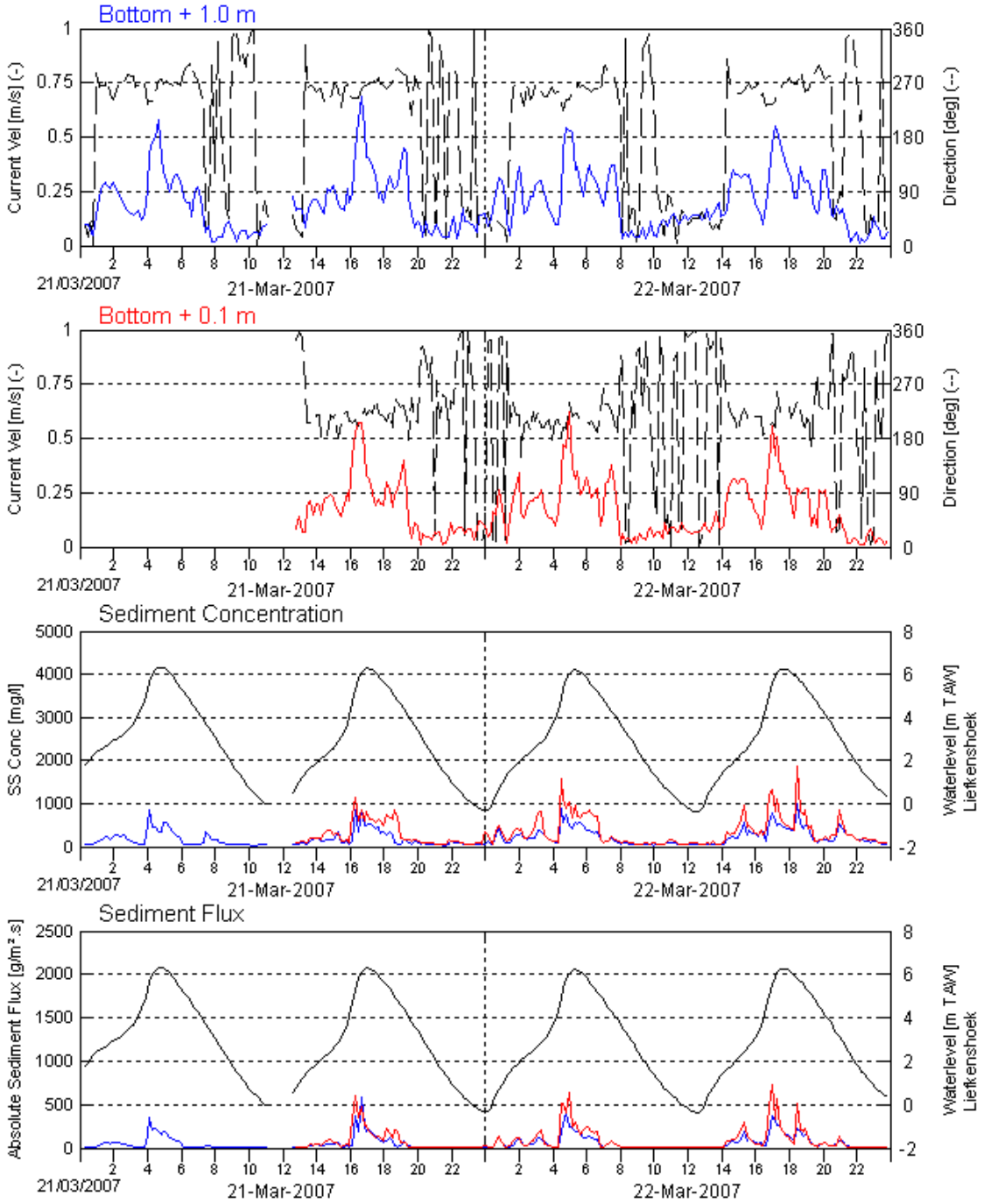
Date: 19/03/2007– 20/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok Sill

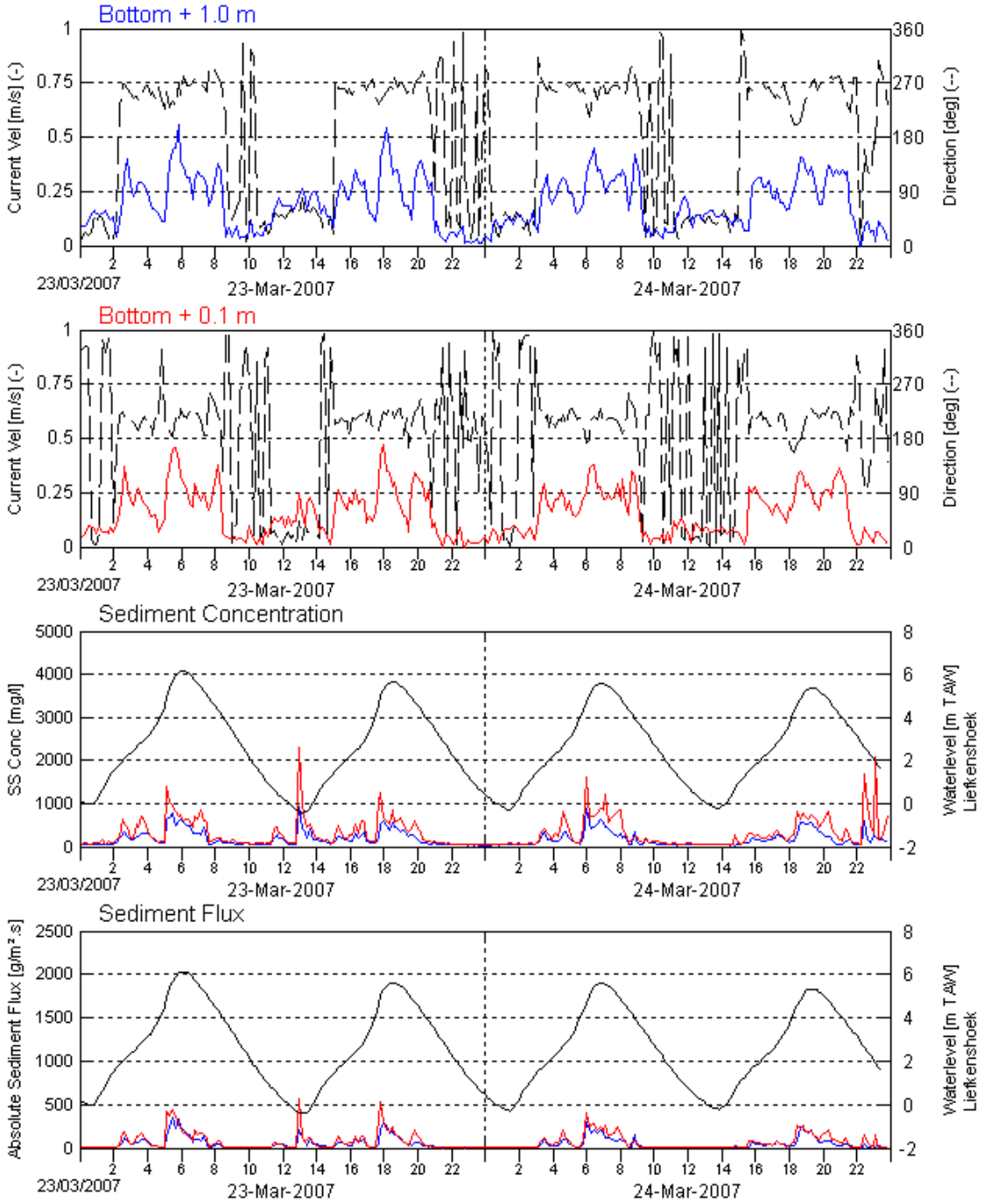
Date:
21/03/2007– 22/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

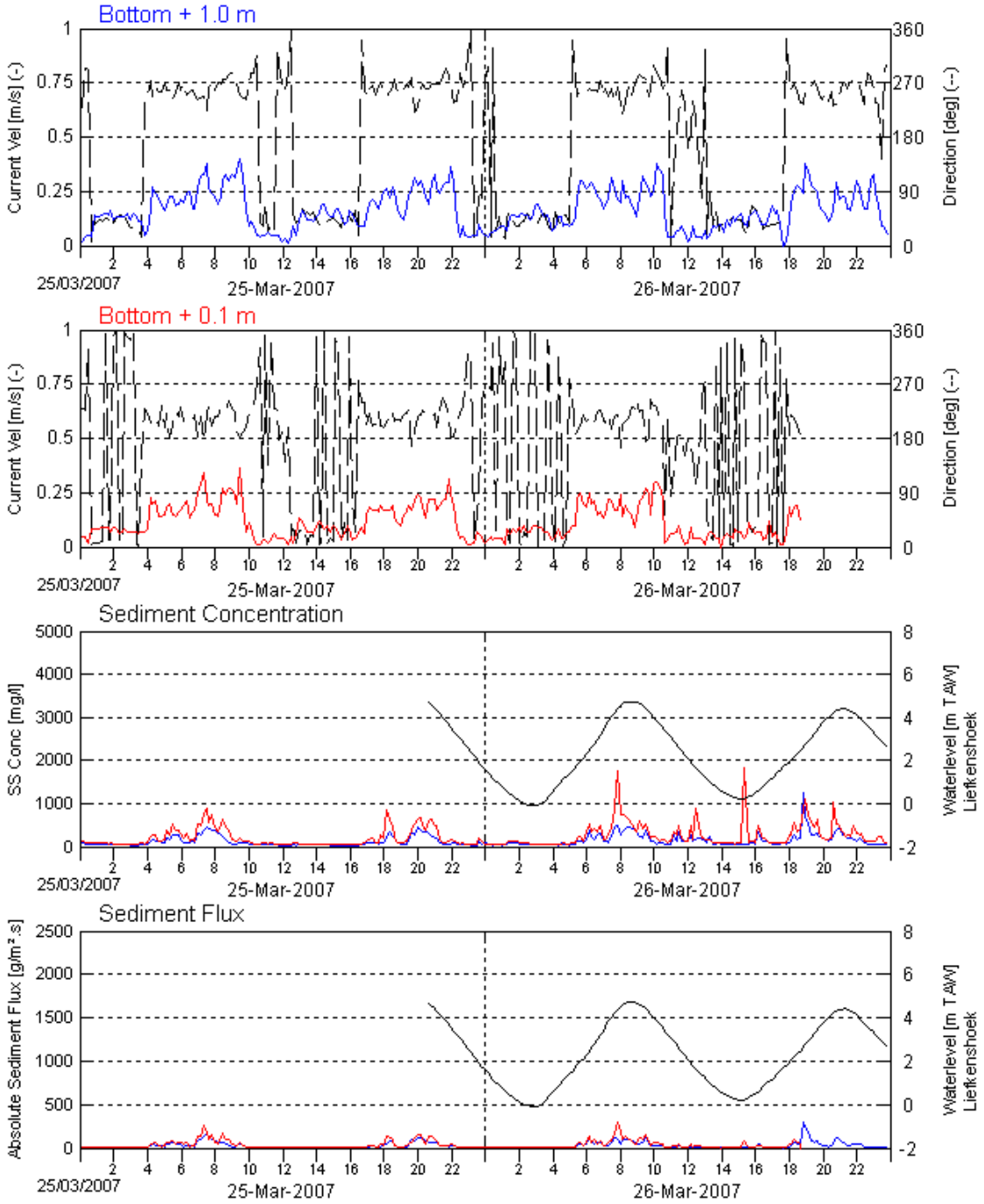
Date: 23/03/2007– 24/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok Sill

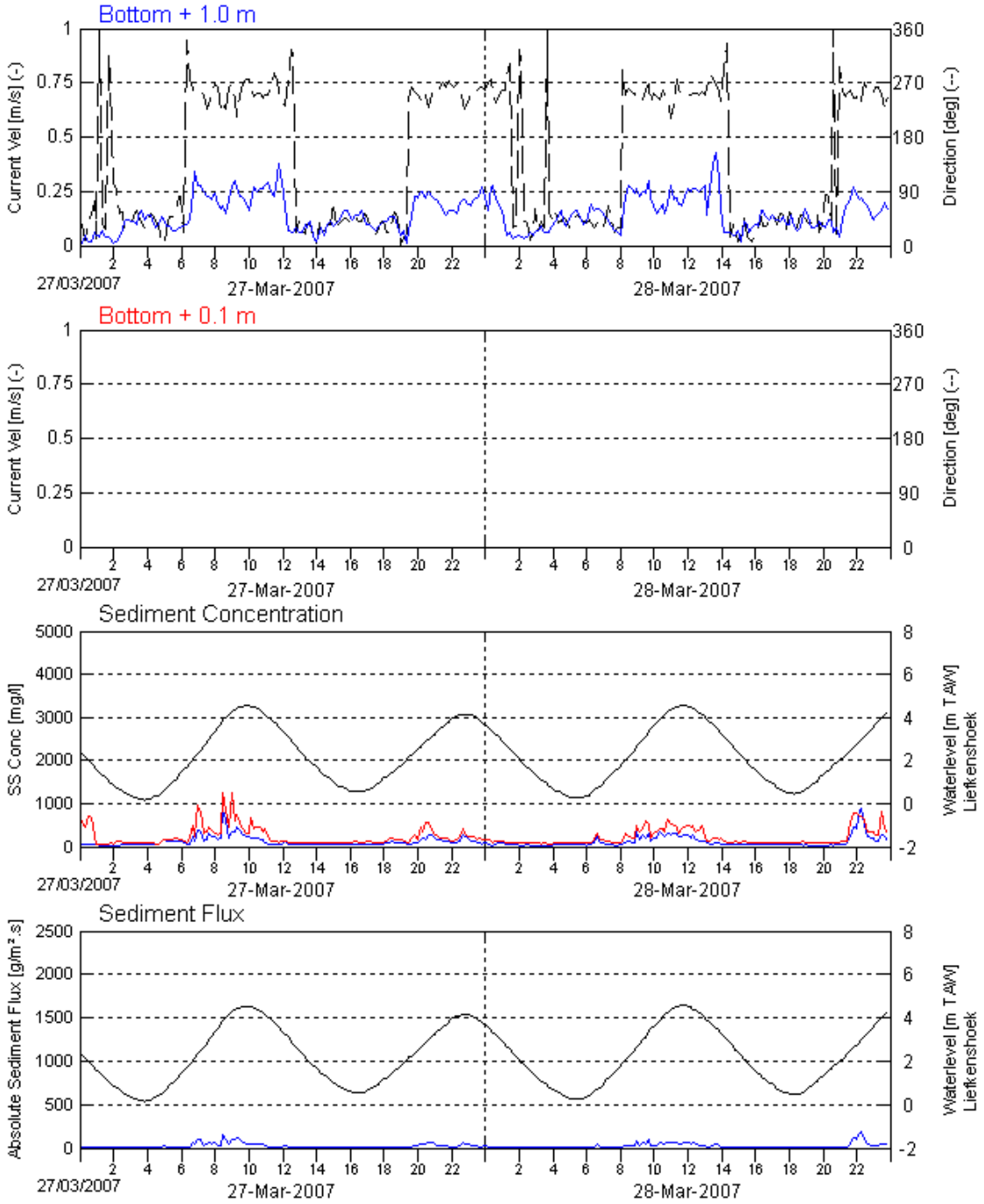
Date:
25/03/2007– 26/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

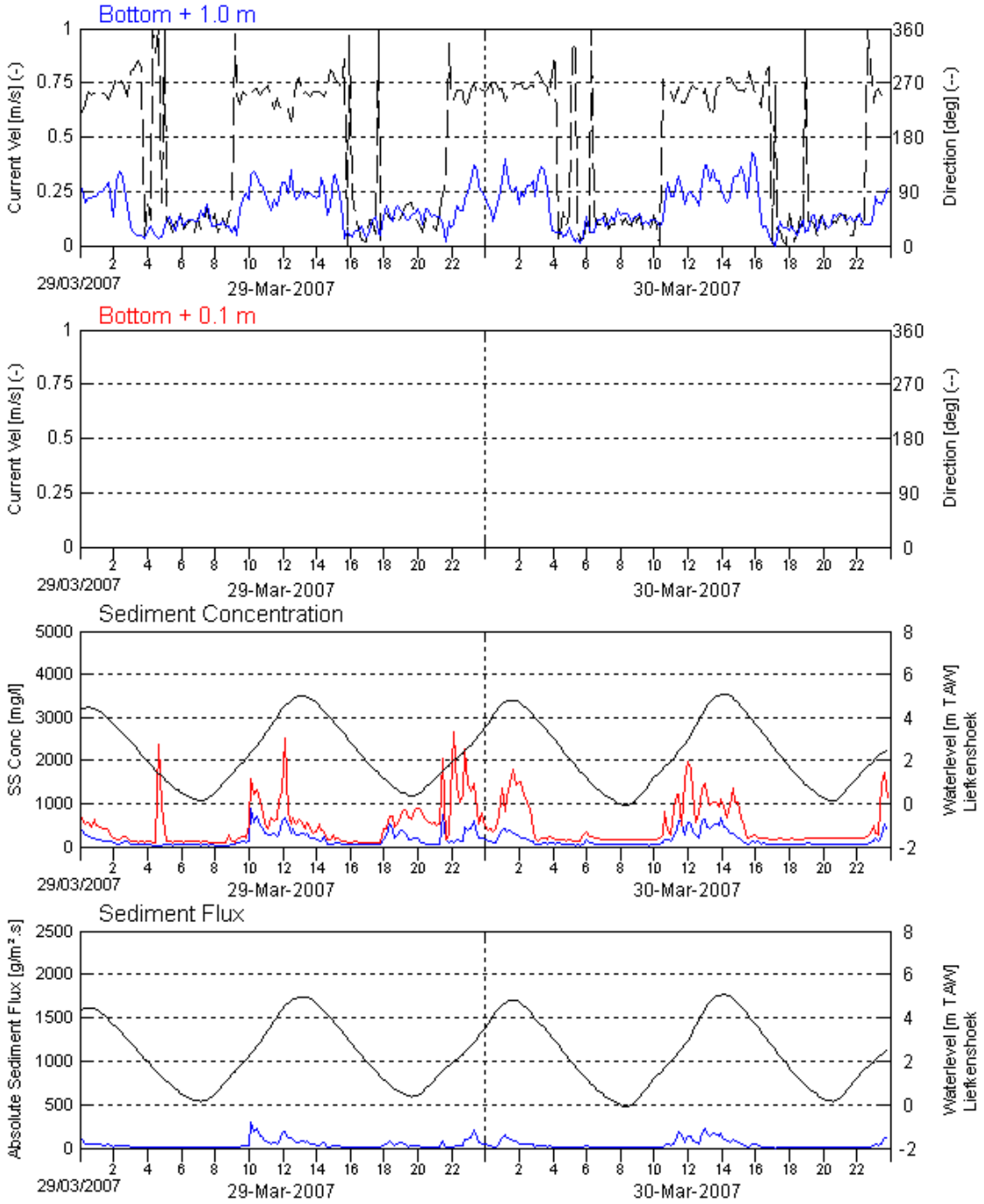
Date: 27/03/2007– 28/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok Sill

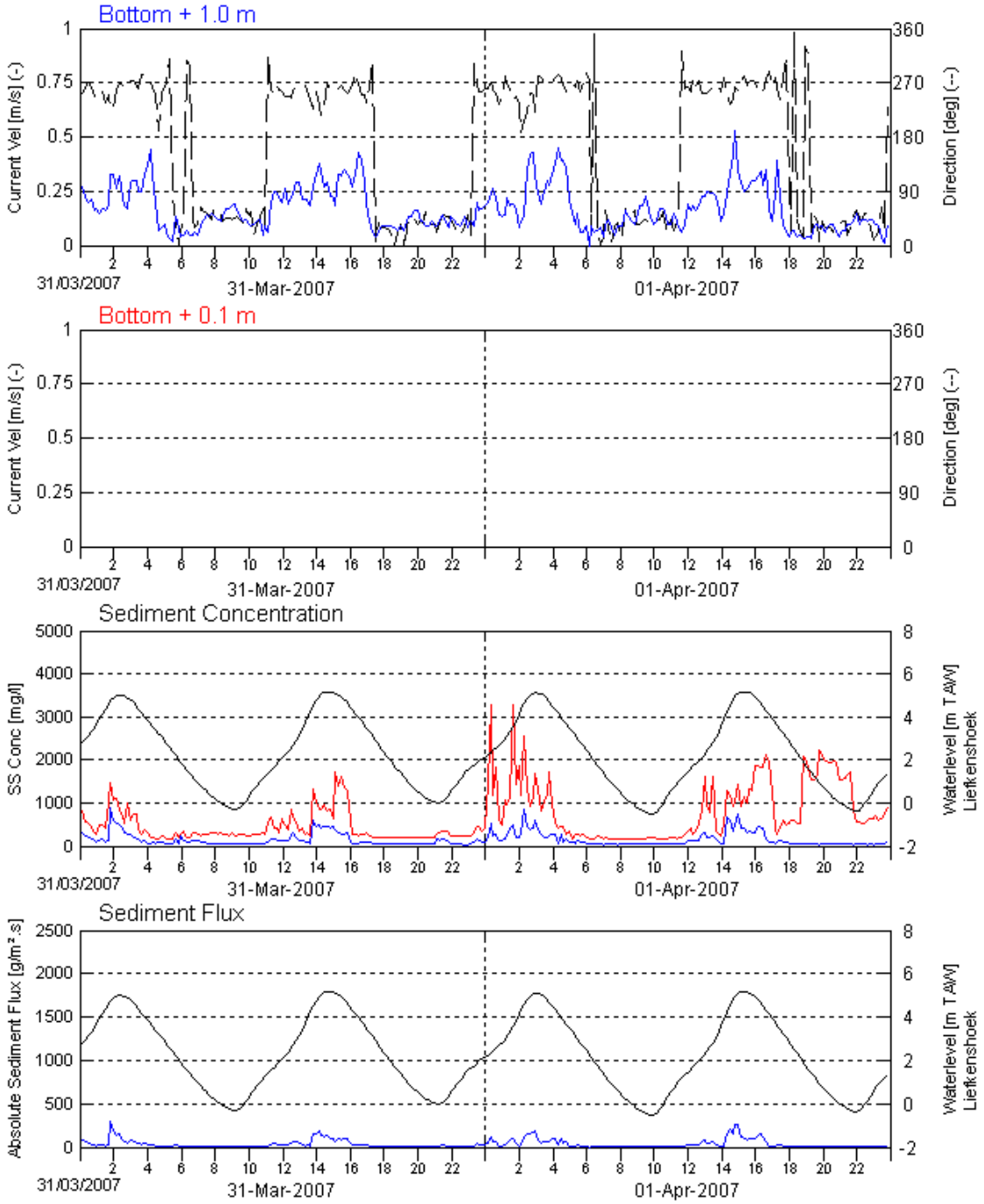
Date:
29/03/2007– 30/03/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

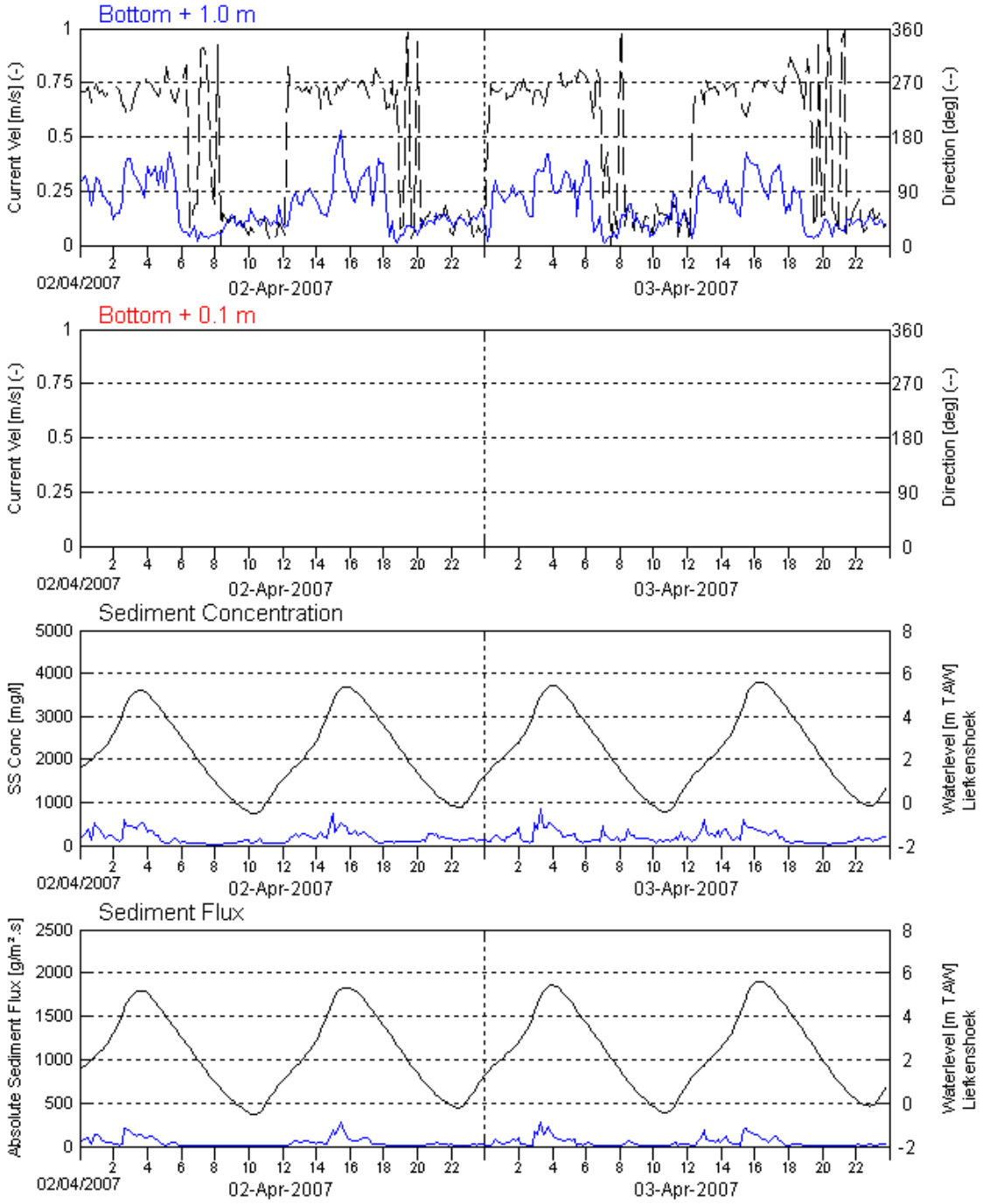
Date: 31/03/2007– 01/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok Sill

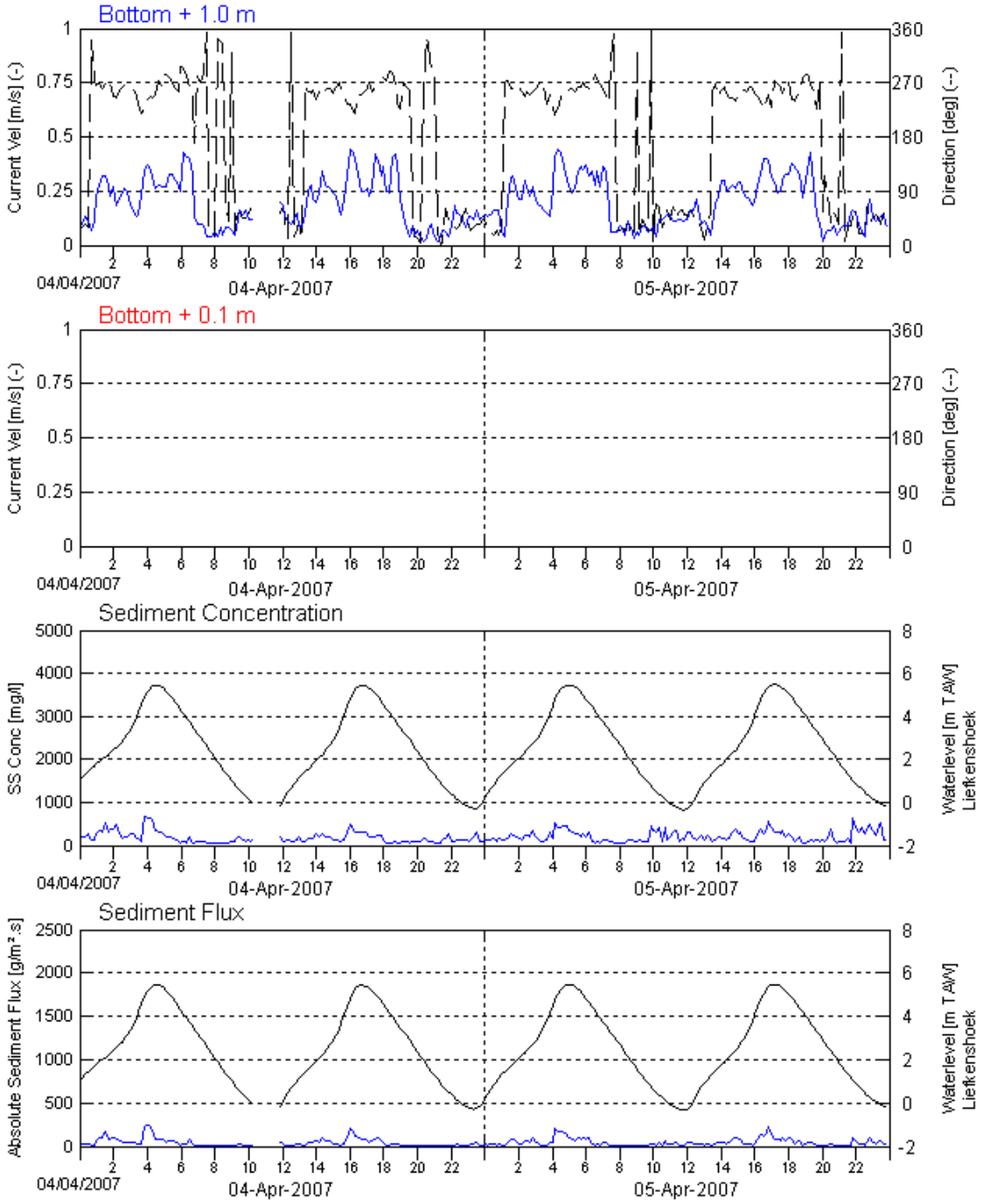
Date:
02/04/2007– 03/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

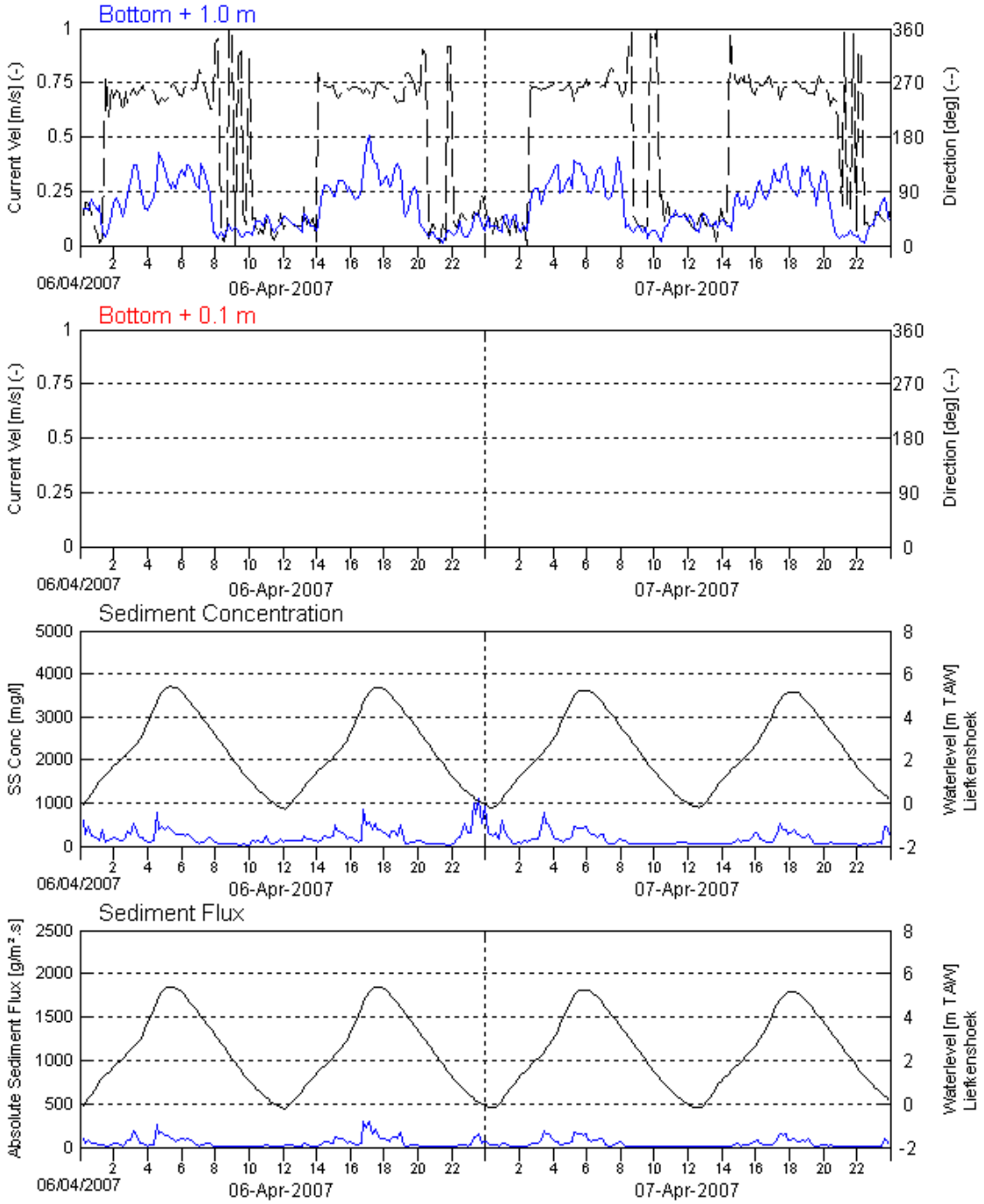
I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel		Data processed by: IMDC
Location: Deurganckdok Sill	Date: 04/04/2007– 05/04/2007	In association with: WL | delft hydraulics, GEMS International
		I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

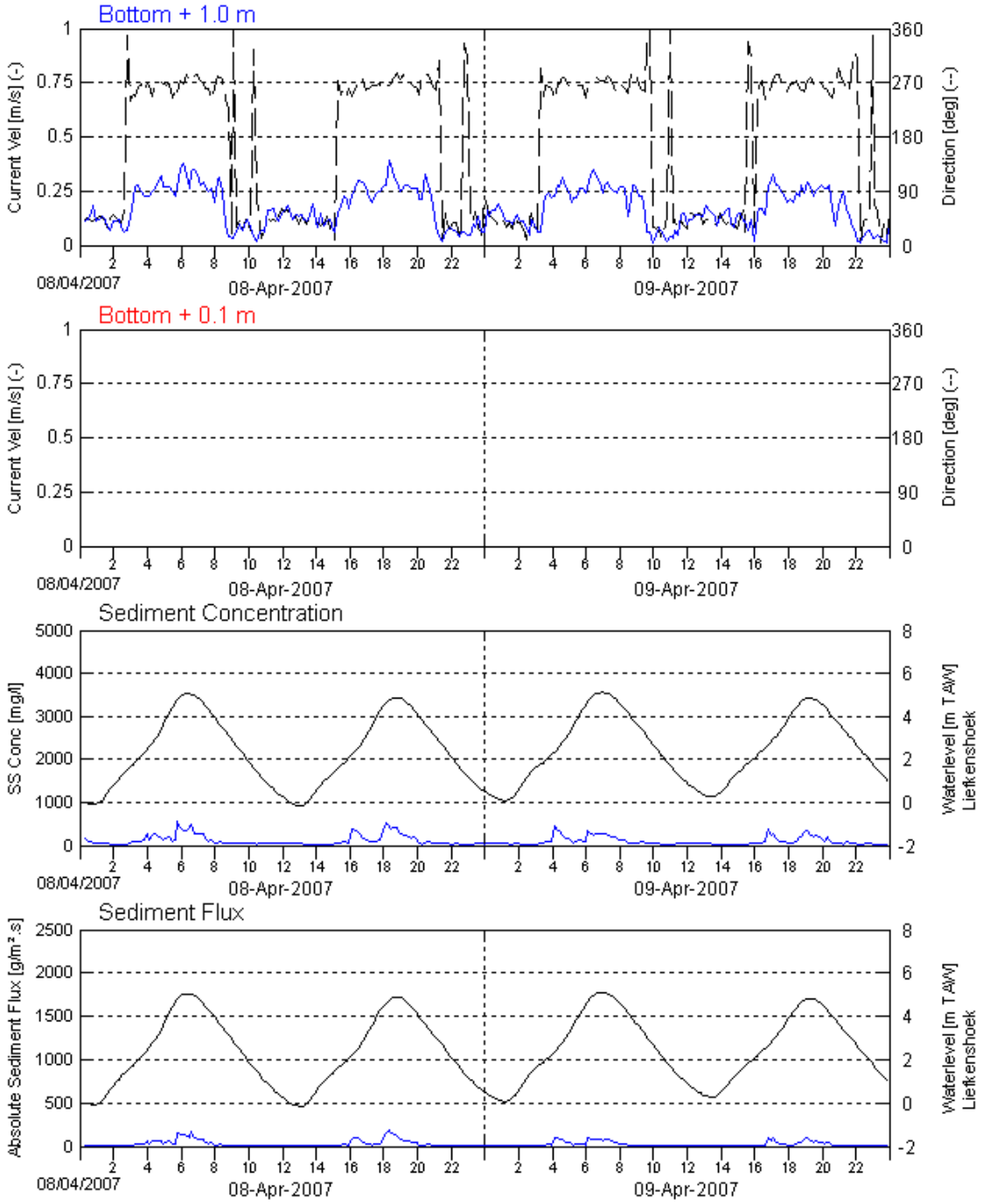
Location:	Date:
Deurganckdok Sill	06/04/2007– 07/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

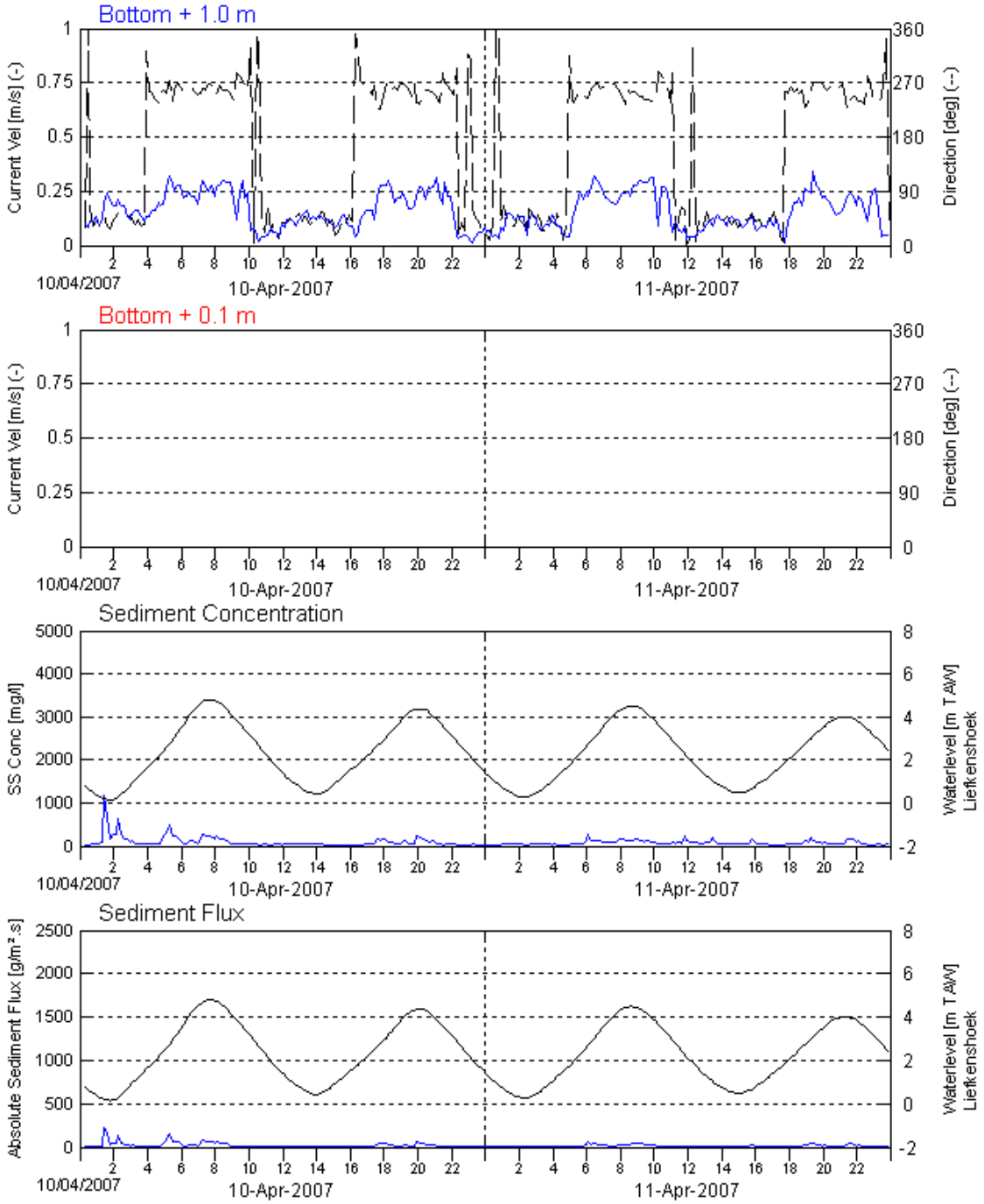
Date: 08/04/2007– 09/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

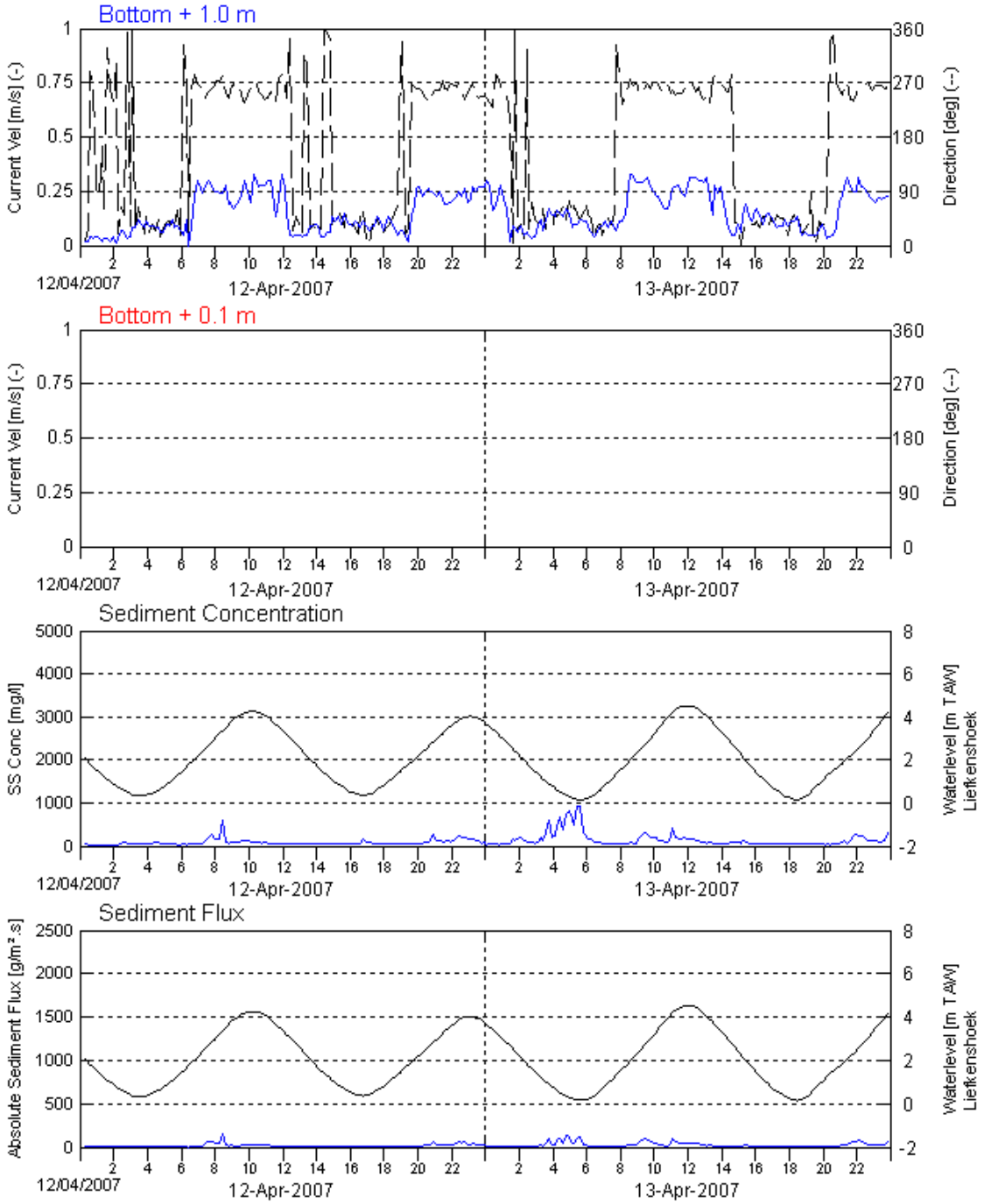
Date: 10/04/2007– 11/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location:
Deurganckdok Sill

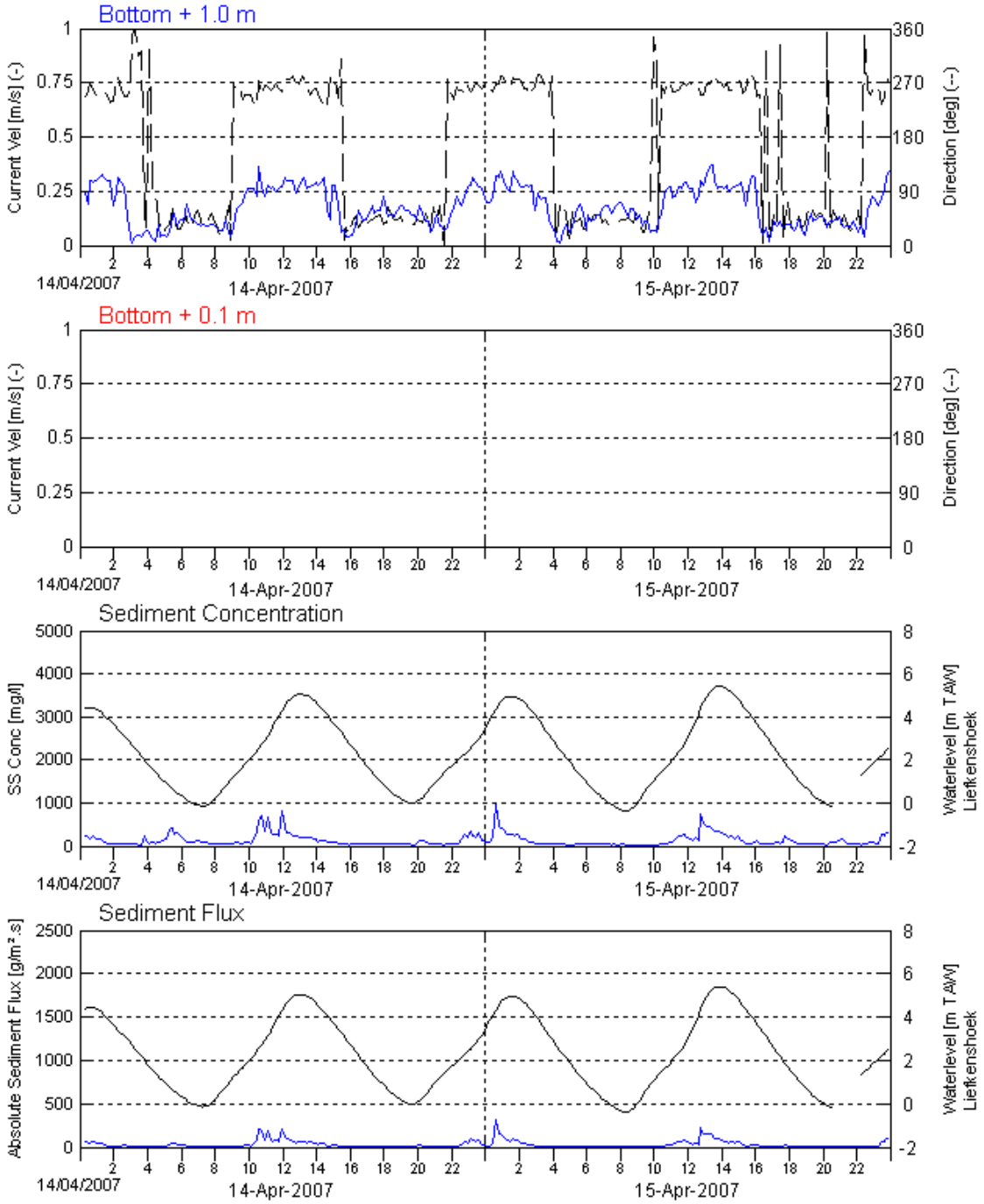
Date:
12/04/2007– 13/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

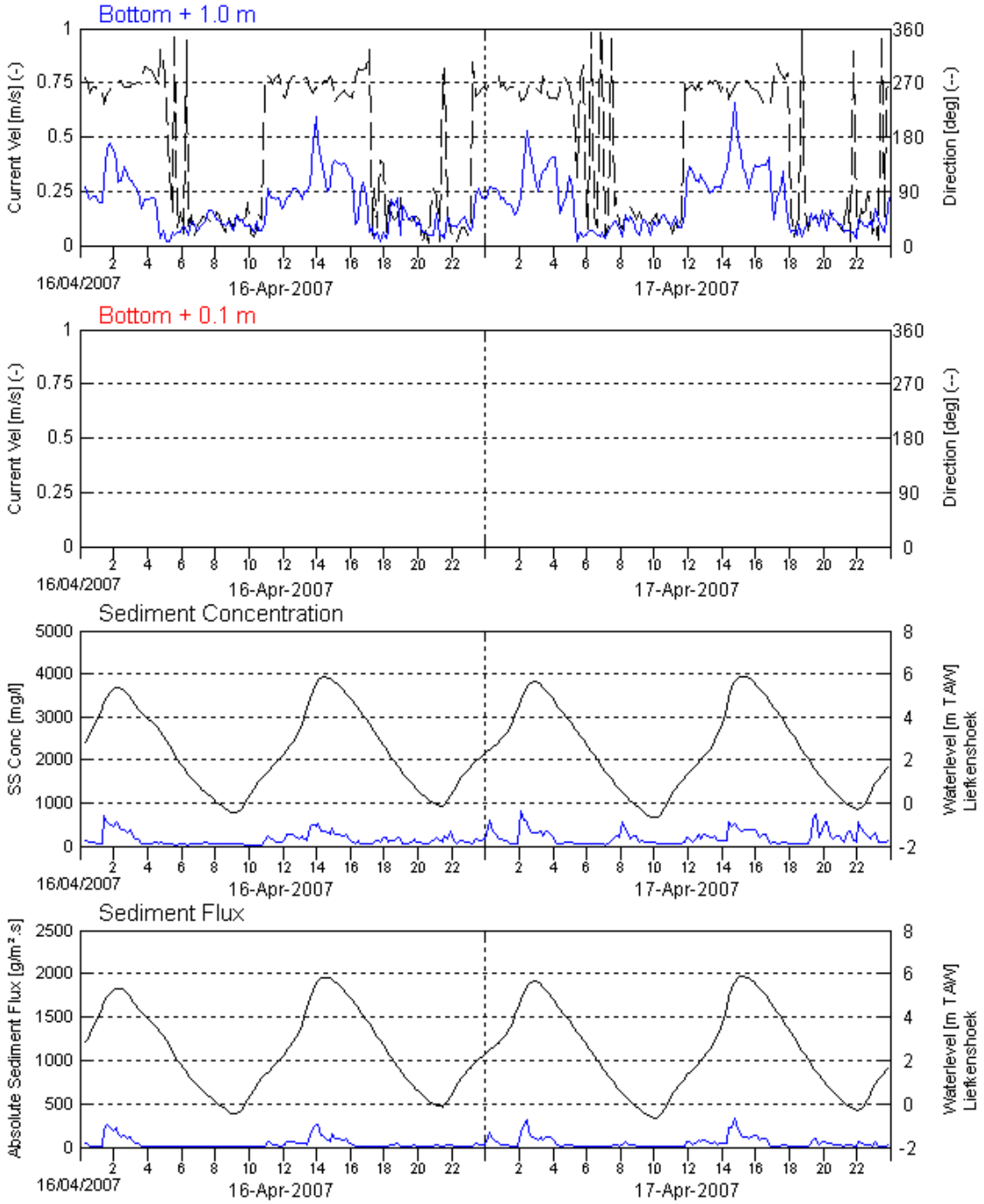
Date: 14/04/2007– 15/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

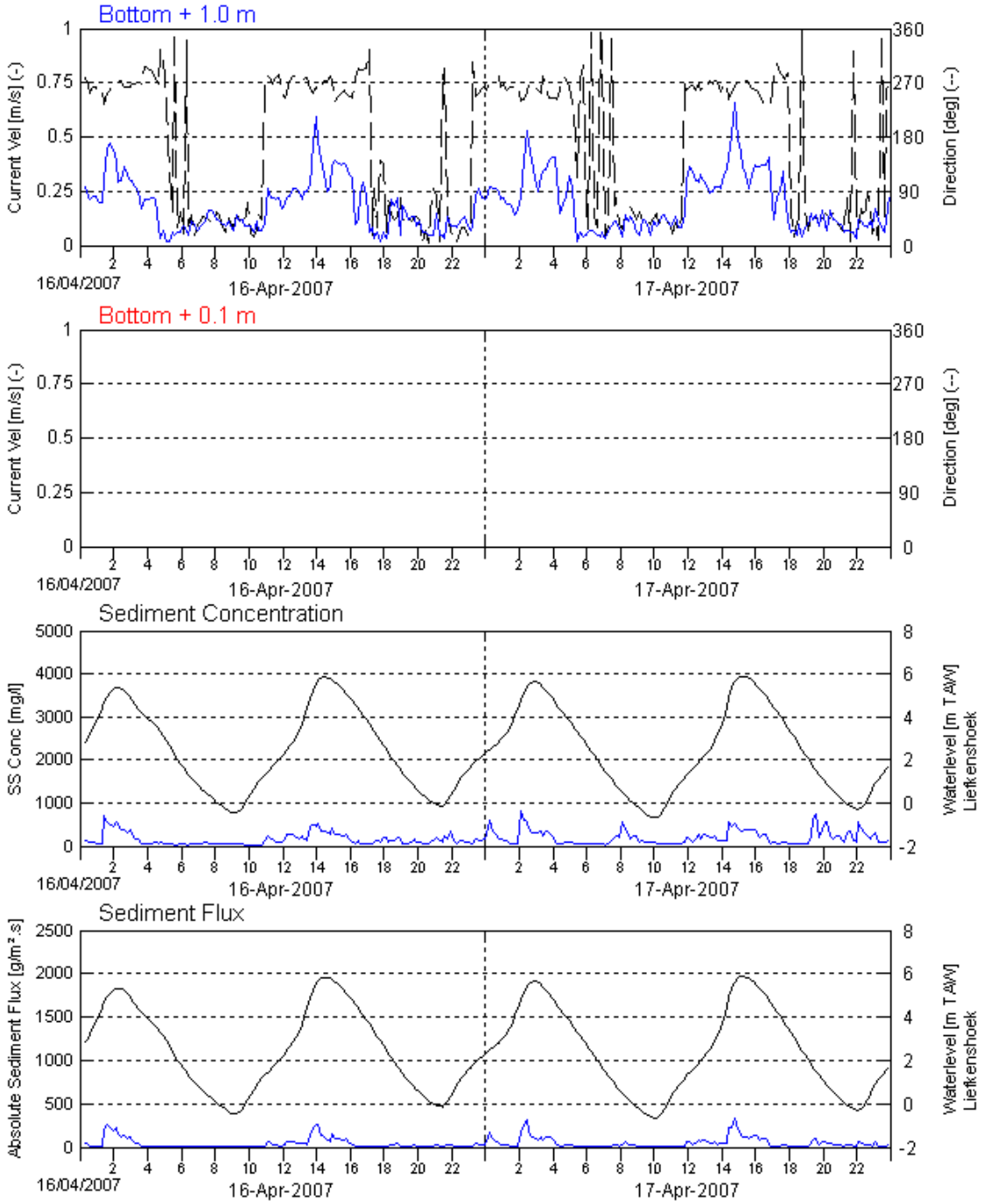
Date: 16/04/2007– 17/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel

Location: Deurganckdok Sill

Date: 18/04/2007

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123MSA

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070209	1	flood	4.8	0.2	193.8	0.2	193	158.5	217.2	39.9	43.4
20070210	1	ebb	4.7	0.2	172.6	0.1	180.6	86.4	134.8	19.5	24.1
20070210	2	flood	4.6	0.2	189.4	0.1	186	151.7	202.3	35.3	37.3
20070210	2	ebb	4.7	0.2	122.7	0.1	162	81.5	134.7	17.5	22.2
20070210	3	flood	4.5	0.2	178.4	0.1	187	172.3	240.7	42.5	48.1
20070211	3	ebb	4.1	0.2	156.8	0.1	154.2	106.3	168.8	24.7	30.4
20070211	4	flood	3.7	0.2	182.3	0.1	170.2	76	129.9	17.7	23.1
20070211	4	ebb	3.6	0.1	164.4	0.1	155.2	91.4	126.7	14	16.4
20070211	5	flood	4	0.2	175.7	0.1	217	104.8	152.7	25.1	29
20070212	5	ebb	3.8	0.1	173.9	0.1	200.1	60.2	117.8	11	16.4
20070212	6	flood	3.6	0.2	160.2	0.1	157.2	53.8	82.4	11.5	12.7
20070212	6	ebb	2.9	0.1	158.8	0.1	172	70.8	120.2	10.5	14.2
20070212	7	flood	3.3	0.2	176.3	0.1	172.4	73	113.4	13.9	16.2
20070213	7	ebb	3	0.1	107.6	0.1	143.5	34.9	56.6	4.9	5.5
20070213	8	flood	2.8	0.2	154.5	0.1	160.8	40.7	66.4	6.9	8.4
20070213	8	ebb	3.8	0.1	93.9	0.1	126.2	31.5	50.2	4.7	5.3
20070214	9	flood	3.6	0.2	190.7	0.1	184.1	92.6	132	19.8	22.3
20070214	9	ebb	3.8	0.1	139.4	0.1	165.3	41.6	68.4	6.8	8.1
20070214	10	flood	4.1	0.2	174.7	0.1	179	107.9	188.3	23.6	33.5
20070214	10	ebb	4.1	0.2	143.8	0.1	151.3	54.9	93.5	10.6	14.4
20070215	11	flood	4.5	0.2	194	0.1	201	218.7	333.5	49.7	55.8
20070215	11	ebb	4.7	0.2	119.4	0.1	138.5	66	110.5	13.1	16.2
20070215	12	flood	4.6	0.2	201.3	0.1	184.5	200.4	284.6	49.8	54.7
20070215	12	ebb	5	0.1	147.1	0.1	156.4	96.5	155.2	19.2	24.2
20070216	13	flood	4.7	0.2	184	0.1	176.2	280.3	441.6	79.2	91.8
20070216	13	ebb	5	0.2	146.6	0.1	180.1	147.2	263.5	36.5	44.8
20070216	14	flood	5.5	0.2	198.2	0.1	189.1	360.4	595.8	109.6	132.6

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070216	14	ebb	5	0.2	144.9	0.1	166.5	163.6	306.5	42.1	56.6
20070217	15	flood	5.3	0.2	194.2	0.1	202.4	305.7	500.9	84.8	108.5
20070217	15	ebb	5.4	0.2	143.8	0.1	163	162	281.5	41.4	50.2
20070217	16	flood	5.9	0.2	195.5	0.2	194.7	344.9	681.7	105.6	154.5
20070217	16	ebb	5.8	0.2	149.1	0.1	140	184	353.2	49.7	68.8
20070218	17	flood	6	0.2	167.1	0.1	171.8	221.2	373.1	68.4	86.9
20070218	17	ebb	6.2	0.2	181.5	0.1	158.6	137.6	463.3	34.5	54.2
20070219	18	flood	6	0.2	189	0.1	195.5	265.3	479.5	87.8	112.6
20070219	18	ebb	6.4	0.2	150.8	-	-	175.4	409.1	44.8	-
20070219	19	flood	6.6	0.2	193.2	-	-	268.1	583.7	99.1	-
20070219	19	ebb	6.2	0.2	163.6	-	-	184.1	321.4	43.7	-
20070220	20	flood	6.2	0.2	199.7	-	-	340.3	596.5	111.1	-
20070220	20	ebb	6.6	0.2	160	-	-	168.3	474.5	39.9	-
20070220	21	flood	6.6	0.3	198.6	-	-	335.2	822.1	115.3	-
20070221	21	ebb	6.2	0.2	124.8	-	-	168.4	409.9	49.5	-
20070221	22	flood	6.1	0.2	187.8	-	-	413.1	863.1	131.2	-
20070221	22	ebb	6.4	0.2	181.2	-	-	222.4	438.1	63.3	-
20070221	23	flood	6.3	0.3	186.1	0.2	274.3	336.2	509.3	129	-
20070222	23	ebb	6.2	0.2	163.8	0.1	182.7	203.3	365.7	63.6	79.2
20070222	24	flood	5.9	0.3	217.4	0.2	257.2	464.7	761.6	150.8	175
20070222	24	ebb	6.3	0.1	151.3	0.1	174.5	174.6	274.3	41.6	47.8
20070222	25	flood	6	0.3	206.6	0.2	249.5	374.3	509.9	133.5	130.4
20070223	25	ebb	5.8	0.2	154.9	0.1	195.2	205.6	355.1	54.4	66.8
20070223	26	flood	5.7	0.2	199.2	0.2	273.1	407.3	669.4	130.4	145
20070223	26	ebb	5.9	0.2	159.4	0.1	198.2	201.6	531.4	51.4	80.3
20070223	27	flood	5.6	0.2	195.3	0.2	234.9	360.9	561.7	130.9	137.9
20070224	27	ebb	5.2	0.2	137.1	0.1	203.5	203.5	357.1	57.1	67.3

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070224	28	flood	5.3	0.2	203.7	0.1	240.3	368.2	649.9	127.2	148.1
20070224	28	ebb	5.1	0.1	165.1	0.1	186.7	150.7	259.7	38.8	43.9
20070224	29	flood	5.1	0.2	202.3	0.1	263.1	369.9	570	117	118
20070225	29	ebb	4.9	0.1	167.9	0.1	198.9	141.3	251.2	33.1	38.5
20070225	30	flood	5	0.2	176.8	0.1	230.8	310.5	541.4	94.7	115.3
20070225	30	ebb	4.7	0.1	148.7	0.1	191.3	159.1	240.6	36.8	34.7
20070225	31	flood	4.3	0.2	185	0.1	213.3	174	335.3	44.5	54.9
20070226	31	ebb	4.2	0.1	143.7	0.1	180.9	95.3	150.6	18.9	17.7
20070226	32	flood	4.2	0.2	171.2	0.1	228.1	143.3	212.6	33	32.4
20070226	32	ebb	4	0.1	150.2	0.1	181.8	143.1	281.7	19.7	21.1
20070226	33	flood	3.8	0.1	186.4	0.1	247.7	108.1	161.1	20.9	19.6
20070227	33	ebb	4.2	0.1	125.6	0.1	186.6	87.3	132.1	15.2	15.4
20070227	34	flood	4	0.2	173.1	0.1	237.5	151	215	31.4	28.4
20070227	34	ebb	3.9	0.2	135.9	0.1	209.1	337.6	490.9	44.4	48.8
20070228	35	flood	3.9	0.2	162.4	0.1	223.7	366.7	802.2	51.3	75.7
20070228	35	ebb	4	0.2	155.2	0.1	191.9	222.5	565.1	32.7	40.2
20070228	36	flood	4.7	0.2	202	0.1	242.9	192.7	567.3	46.9	72.5
20070228	36	ebb	4.1	0.1	181	0.1	168.6	88.3	189	15.8	17.8
20070301	37	flood	4.3	0.2	164.6	0.1	216.8	104.6	208.8	21.1	22.4
20070301	37	ebb	4.4	0.2	143.3	0.1	179.7	308.3	864.6	49.3	44.3
20070301	38	flood	4.7	0.2	171.8	0	203.8	160.3	816.4	32.7	32.7
20070301	38	ebb	4.8	0.1	165.3	0	150.9	240.7	828.8	37.8	28.3
20070302	39	flood	4.8	0.2	192.5	0	207.2	188.6	939	37.6	30.4
20070302	39	ebb	5.4	0.2	133.3	0	172.8	174.8	443.7	26.2	20.5
20070302	40	flood	5.4	0.2	180.9	0.1	221	184.3	587.6	50.7	44.3
20070302	40	ebb	5.7	0.2	159.9	0	178	149.7	662.4	30.4	35
20070303	41	flood	5.2	0.2	174.1	0	157.4	234.6	608.1	35.2	5.3

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070303	41	ebb	4	0.2	186.8	0	147.2	143.8	649.1	31.3	19.4
20070303	42	flood	4.8	0.2	177.3	0	194.6	132.6	604.8	38.2	35.3
20070303	42	ebb	5.9	0.2	141.3	0	149.4	93	515.1	21.8	35.3
20070304	43	flood	5.4	0.2	165.5	0.1	186.2	101.2	341.4	30.8	29.1
20070304	43	ebb	5.8	0.2	170.8	0.1	154.7	191.9	636.2	48.5	59.2
20070305	44	flood	5.6	0.2	164.4	0	185.4	250.4	153.7	70.9	-31.6
20070305	44	ebb	5.7	0.1	208.1	0	123	124.3	-	27.4	-44
20070305	45	flood	6	0.2	193.5	0.1	194.5	274	-	102.6	-72.1
20070305	45	ebb	5.4	0.2	191.6	0.1	140.8	203.6	-	46.8	-53.7
20070306	46	flood	5.6	0.2	179.7	0.1	199.7	222.5	-	68.9	-61.5
20070306	46	ebb	6	0.1	199.8	0	115.9	124.2	-	30.7	-44.3
20070306	47	flood	5.3	0.2	168.4	0.1	210.6	159	-	53.4	-65.7
20070306	47	ebb	4.8	0.1	218.4	0	161.5	140.5	-	37.4	-43.4
20070307	48	flood	5.9	0.2	183.7	0.1	226	172.3	-	51.8	-57.1
20070307	48	ebb	5	0.2	251.1	0.1	146	131.4	-	38.6	-58.2
20070308	49	flood	4.7	0.2	176.1	0	152.5	267.2	-	68.4	-21.9
20070308	49	ebb	5.9	0.1	235.5	-	-	162.2	-	25.8	-
20070308	50	flood	5.6	0.2	175	-	-	250.6	-	74.9	-
20070309	50	ebb	5.5	0.1	222	-	-	150.1	-	24.6	-
20070309	51	flood	5.3	0.2	160.4	-	-	245	-	61.4	-
20070309	51	ebb	5.4	0.1	209.8	-	-	104.3	-	19.8	-
20070309	52	flood	5.7	0.2	184.9	-	-	219.8	-	69.3	-
20070310	52	ebb	5.1	0.1	229.8	-	-	125.7	-	25.7	-
20070310	53	flood	4.8	0.2	194.2	-	-	191.6	-	48.8	-
20070310	53	ebb	5.4	0.1	209.8	-	-	100.2	-	14.2	-
20070310	54	flood	5	0.2	188.8	-	-	195.3	-	57.2	-
20070311	54	ebb	4.7	0.1	206	-	-	103.8	-	19.7	-

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070311	55	flood	4.7	0.2	198.6	-	-	139	-	33.3	-
20070311	55	ebb	4.9	0.1	215	-	-	80.7	-	15.4	-
20070311	56	flood	4.8	0.2	161.7	-	-	106	-	27	-
20070312	56	ebb	4.5	0.1	202.4	-	-	83.1	-	13.5	-
20070312	57	flood	4.5	0.1	181.7	-	-	96	-	19	-
20070312	57	ebb	4.5	0.1	253.7	-	-	121	-	14.2	-
20070312	58	flood	4.2	0.2	165.3	-	-	227.4	-	39.6	-
20070313	58	ebb	3.9	0.1	248	-	-	82.8	-	11.9	-
20070313	59	flood	4	0.1	228.3	-	-	104.5	-	20.1	-
20070313	59	ebb	3.8	0.1	232.9	-	-	50	-	6.3	-
20070313	60	flood	3.4	0.1	157.5	-	-	59.2	-	8.7	-
20070314	60	ebb	3.3	0.1	218.8	-	-	35.9	-	3.3	-
20070314	61	flood	3.3	0.1	164.5	-	-	76.3	-	15.2	-
20070314	61	ebb	3.6	0.1	202.5	-	-	44.7	-	4.4	-
20070314	62	flood	3.5	0.1	210.1	-	-	63.8	-	10.9	-
20070315	62	ebb	3.5	0.1	231.5	-	-	38.2	-	3.4	-
20070315	63	flood	4.1	0.1	199.7	-	-	108.9	-	20.1	-
20070315	63	ebb	4.2	0.1	222.4	-	-	125.9	-	14.5	-
20070316	64	flood	4.4	0.1	168.5	-	-	107.9	-	20	-
20070316	64	ebb	4.2	0.1	173.2	-	-	52.2	-	8.7	-
20070316	65	flood	4.6	0.2	168.5	-	-	90.8	-	21.1	-
20070316	65	ebb	5	0.1	154.8	-	-	61.5	-	11.9	-
20070317	66	flood	5.1	0.2	171.6	-	-	111	-	29.7	-
20070317	66	ebb	4.4	0.1	184.3	-	-	72.4	-	14.3	-
20070317	67	flood	5.3	0.2	182.5	-	-	117.2	-	32.7	-
20070317	67	ebb	5.8	0.1	154.5	-	-	57.1	-	11.6	-
20070318	68	flood	6.7	0.2	210	-	-	183.4	-	58.4	-

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070318	68	ebb	5.6	0.2	140.3	-	-	99.3	-	26.3	-
20070319	69	flood	5.3	0.2	209.7	-	-	158.8	-	48.5	-
20070319	69	ebb	6.4	0.2	140.7	-	-	141.4	-	28.6	-
20070319	70	flood	6.2	0.2	191.3	-	-	199.8	-	66.1	-
20070319	70	ebb	6.1	0.2	161.2	-	-	136.1	-	33.3	-
20070320	71	flood	5.7	0.2	192.8	-	-	176.3	-	47	-
20070320	71	ebb	6.3	0.1	171	-	-	107.4	-	28.2	-
20070320	72	flood	6.7	0.2	177.6	-	-	141.1	-	50.4	-
20070320	72	ebb	6.3	0.2	191.6	-	-	129	-	32.2	-
20070321	73	flood	6.1	0.2	192.3	-	-	187.6	-	56.5	-
20070321	73	ebb	6.4	0.1	227.3	-	-	133.4	-	26.5	-
20070322	74	flood	5.7	0.2	207.1	0.2	219.7	201.1	327.4	62.5	91.6
20070322	74	ebb	6.5	0.2	164.4	0.1	217.6	133.2	214.1	33	47
20070322	75	flood	6.6	0.3	188.1	0.2	212	259.8	409.5	87.7	134.7
20070323	75	ebb	6.3	0.2	190.5	0.1	225.3	232.8	325.7	47.9	55.4
20070323	76	flood	6.2	0.2	183.6	0.2	196.4	242.9	375.3	75.5	106.7
20070323	76	ebb	6.5	0.2	148.9	0.1	154.2	176.7	307.5	42.6	60.3
20070323	77	flood	6	0.2	185.1	0.2	183.5	227.2	389.3	68.8	99.4
20070324	77	ebb	5.9	0.1	169.4	0.1	189	105	169.4	21.8	31.7
20070324	78	flood	5.7	0.2	197.4	0.2	220.1	214.3	356.2	64.7	89.3
20070324	78	ebb	5.8	0.2	148.5	0.1	182.6	125.5	227.6	31.2	45
20070324	79	flood	5.5	0.2	209	0.2	190.3	187.8	290	54.3	67.6
20070326	79	ebb	5.4	0.2	179.1	0.1	188.5	116.5	223.8	23.9	35.7
20070326	80	flood	4.8	0.2	175.1	0.1	184.4	159.5	308.8	36.8	54.2
20070326	80	ebb	4.5	0.1	169.3	0.1	171.9	150.7	240.4	20.6	28.2
20070326	81	flood	4.2	0.2	170.1	-	-	219.6	377.8	49.7	-
20070327	81	ebb	4.2	0.1	156.1	-	-	64.9	202.7	9.9	-

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070327	82	flood	4.4	0.2	172.1	-	-	213.4	371	43.5	-
20070327	82	ebb	4	0.2	134.9	-	-	73	160.1	13.1	-
20070327	83	flood	3.6	0.1	150.1	-	-	109.9	201.1	19.2	-
20070328	83	ebb	3.9	0.1	156.7	-	-	58.4	114.7	9.1	-
20070328	84	flood	4.3	0.2	158.7	-	-	148.6	264.5	30.1	-
20070328	84	ebb	4.1	0.2	125.1	-	-	79.1	173.3	15.8	-
20070329	85	flood	4	0.1	176.1	-	-	190.8	322.6	37.5	-
20070329	85	ebb	4.3	0.1	178.8	-	-	71.8	273.9	13.2	-
20070329	86	flood	4.8	0.2	185.2	-	-	250.5	558.4	65	-
20070329	86	ebb	4.6	0.2	145.8	-	-	153.1	333.9	26.8	-
20070330	87	flood	4.4	0.2	185.5	-	-	215.6	936.2	49.1	-
20070330	87	ebb	4.9	0.1	150.6	-	-	88.4	378.8	16.2	-
20070330	88	flood	5.2	0.2	177.4	-	-	277.6	724.3	75	-
20070330	88	ebb	4.9	0.2	147.1	-	-	99.2	322.8	20.1	-
20070331	89	flood	4.8	0.2	178.9	-	-	195.1	607	46.7	-
20070331	89	ebb	5.3	0.2	155.5	-	-	112.5	323.3	19	-
20070331	90	flood	5.5	0.2	184.1	-	-	168.3	489.7	43.5	-
20070331	90	ebb	5.2	0.2	123.2	-	-	114.6	419.9	25	-
20070401	91	flood	5	0.2	180.1	-	-	219.9	948.9	47.5	-
20070401	91	ebb	5.6	0.2	151.5	-	-	101.5	365.1	22.8	-
20070401	92	flood	5.7	0.2	193.1	-	-	189.3	560.1	52.3	-
20070401	92	ebb	5.5	0.1	148.9	-	-	118.4	1359.2	27.4	-
20070402	93	flood	5.5	0.2	184.4	-	-	221.3	649.6	60.5	-
20070402	93	ebb	5.7	0.2	168.9	-	-	112.5	-	25.4	-
20070402	94	flood	5.9	0.2	181.2	-	-	219	-	56.4	-
20070402	94	ebb	5.6	0.2	162.9	-	-	154.1	-	28	-
20070403	95	flood	5.6	0.2	193.8	-	-	230.6	-	62.3	-

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070403	95	ebb	5.9	0.2	160.2	-	-	176.2	-	28.3	-
20070403	96	flood	6.1	0.2	195	-	-	263.3	-	70.8	-
20070403	96	ebb	5.7	0.1	187.2	-	-	118.9	-	23.6	-
20070404	97	flood	5.6	0.2	193.5	-	-	281.3	-	67.8	-
20070404	97	ebb	5.6	0.2	190.5	-	-	117.1	-	24.3	-
20070404	98	flood	5.4	0.2	201.5	-	-	193.1	-	51.9	-
20070404	98	ebb	5.7	0.2	164.4	-	-	128.9	-	23.1	-
20070405	99	flood	5.7	0.2	187.7	-	-	222.1	-	58.2	-
20070405	99	ebb	5.8	0.2	146.2	-	-	172.7	-	29.9	-
20070405	100	flood	5.8	0.2	187.7	-	-	226.1	-	57.2	-
20070405	100	ebb	5.6	0.2	139	-	-	219.9	-	37.6	-
20070406	101	flood	5.6	0.2	192.4	-	-	272.8	-	67.4	-
20070406	101	ebb	5.7	0.2	165.1	-	-	121.5	-	26.2	-
20070406	102	flood	4.8	0.2	212.3	-	-	273.2	-	82.7	-
20070407	102	ebb	5.5	0.1	147.1	-	-	261.8	-	40.7	-
20070407	103	flood	5.4	0.2	175.8	-	-	262	-	62.5	-
20070407	103	ebb	5.4	0.2	164	-	-	110.3	-	24.7	-
20070407	104	flood	5.3	0.2	202.4	-	-	149.1	-	38.6	-
20070408	104	ebb	5.3	0.2	161.6	-	-	120.5	-	23.8	-
20070408	105	flood	5.1	0.2	194.2	-	-	147.6	-	39.1	-
20070408	105	ebb	5.2	0.2	136.4	-	-	88.9	-	20.9	-
20070408	106	flood	5	0.2	176.4	-	-	144.5	-	39.4	-
20070409	106	ebb	4.8	0.1	147.4	-	-	79.9	-	16.8	-
20070409	107	flood	5	0.2	190.7	-	-	135.8	-	34.5	-
20070409	107	ebb	4.8	0.2	150.3	-	-	73.7	-	14.7	-
20070409	108	flood	4.5	0.2	184.2	-	-	102.7	-	24.7	-
20070410	108	ebb	4.7	0.1	156.1	-	-	114.5	-	22.4	-

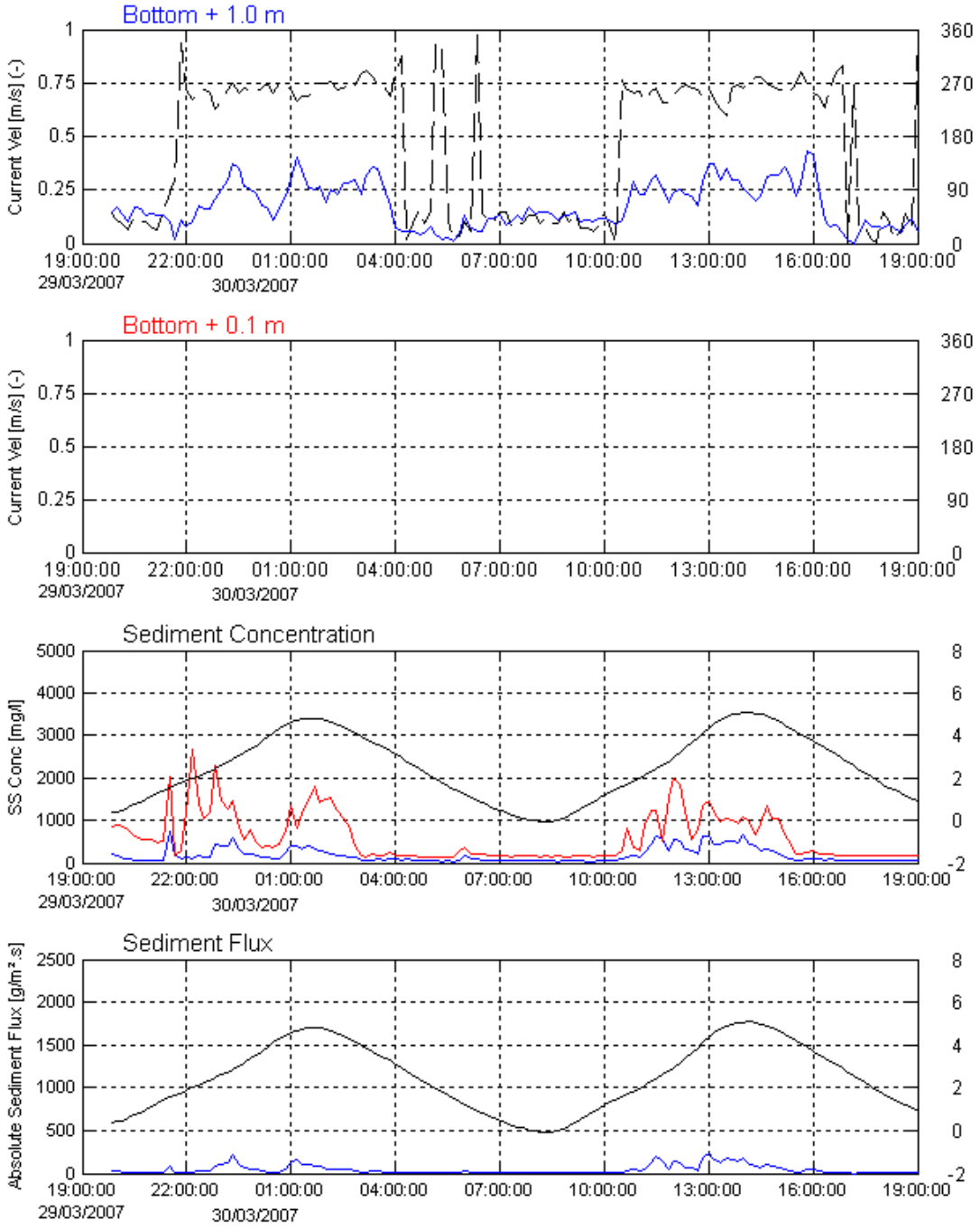
RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070410	109	flood	4.6	0.2	185.1	-	-	163.2	-	37	-
20070410	109	ebb	4.3	0.2	143.5	-	-	66.9	-	13.3	-
20070410	110	flood	3.9	0.2	184.6	-	-	66.2	-	13.7	-
20070411	110	ebb	4.1	0.1	146.5	-	-	47.1	-	7.7	-
20070411	111	flood	4.2	0.2	171	-	-	78.5	-	16.2	-
20070411	111	ebb	4	0.1	131.5	-	-	83.3	-	13	-
20070411	112	flood	3.5	0.2	165.6	-	-	60.3	-	10.8	-
20070412	112	ebb	3.7	0.1	196.7	-	-	53.4	-	6.7	-
20070412	113	flood	3.9	0.2	170.6	-	-	92.5	-	19.3	-
20070412	113	ebb	3.9	0.1	153.4	-	-	57.5	-	8.7	-
20070412	114	flood	3.6	0.2	177.4	-	-	96.4	-	18.8	-
20070413	114	ebb	3.8	0.1	135.4	-	-	234.5	-	31.5	-
20070413	115	flood	4.3	0.2	189.4	-	-	164.1	-	32.5	-
20070413	115	ebb	4.4	0.2	129.3	-	-	66.7	-	12.4	-
20070414	116	flood	4.3	0.2	198	-	-	122.9	-	27.2	-
20070414	116	ebb	4.6	0.1	153.9	-	-	123.4	-	17.1	-
20070414	117	flood	5.2	0.2	196.6	-	-	216.5	-	56.8	-
20070414	117	ebb	5	0.2	118.5	-	-	71.1	-	15.2	-
20070415	118	flood	5	0.2	188.3	-	-	177.1	-	46.6	-
20070415	118	ebb	5.3	0.2	120.5	-	-	61	-	12.7	-
20070415	119	flood	5.8	0.2	200.2	-	-	172.7	-	47.9	-
20070416	119	ebb	5.9	0.2	163.6	-	-	122.1	-	30.3	-
20070416	120	flood	6.3	0.2	197.1	-	-	180	-	56.2	-
20070416	120	ebb	6	0.2	141.5	-	-	137.1	-	28.5	-
20070417	121	flood	5.7	0.2	199.4	-	-	223.3	-	58.9	-
20070417	121	ebb	6.3	0.1	154.4	-	-	144.2	-	25.8	-
20070417	122	flood	6.5	0.3	197.5	-	-	187.2	-	67.9	-

RCM9 & VALEPORT AVERAGES FOR EVERY TIDAL PHASE

Date	Tide no.	Phase	Tidal Diff	UP Velocity (RCM9) Bottom +1.0m		DOWN Velocity (Valeport) Bottom +0.1m		SS Concentration [mg/l]		SS Flux [g/m²s]	
			[m]	Magnitude [m/s]	Direction [°]	Magnitude [m/s]	Direction [°]	UP (RCM9)	DOWN (Valeport)	UP (RCM9)	DOWN (Valeport)
20070417	122	ebb	6.1	0.2	142.9	-	-	227.8	-	41.2	-
20070418	123	flood	6.1	0.2	210.1	-	-	298.1	-	80.7	-

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007



Current Velocity and Direction upper (RCM9) and lower (Valeport) EMC, OBS SS Conc. & flux and waterlevel		Data processed by: IMDC
Location: Deurganckdok Sill	Date: Avg Tide 29/03– 30/03	In association with: WL | delft hydraulics, GEMS International
		I/RA/11283/06.123MSA

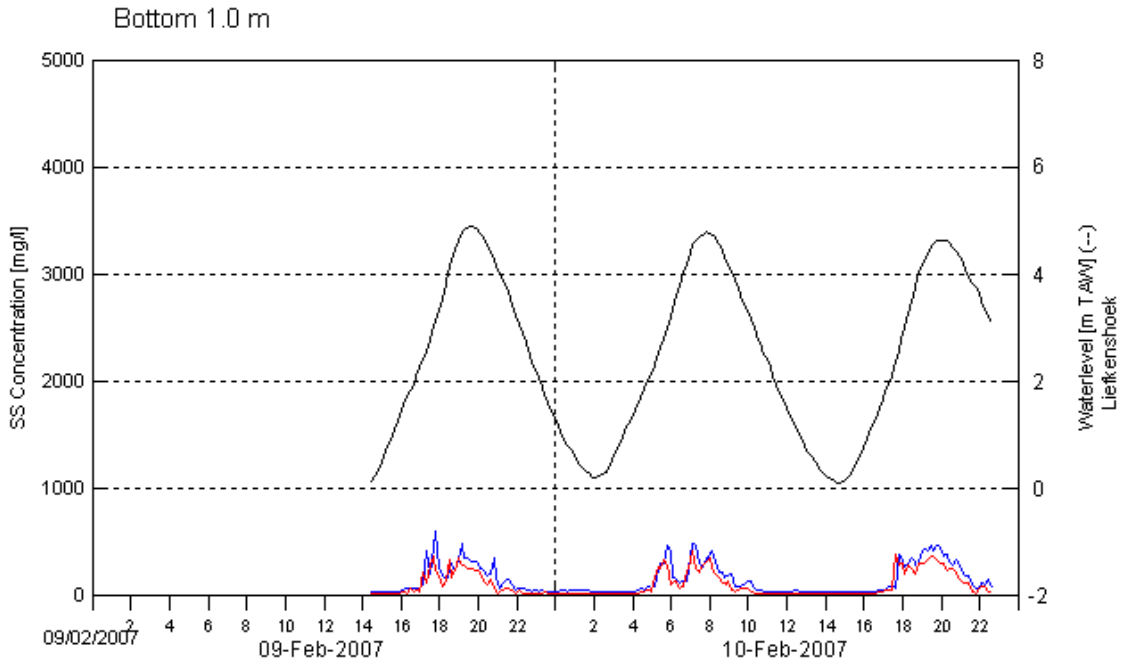
APPENDIX E.

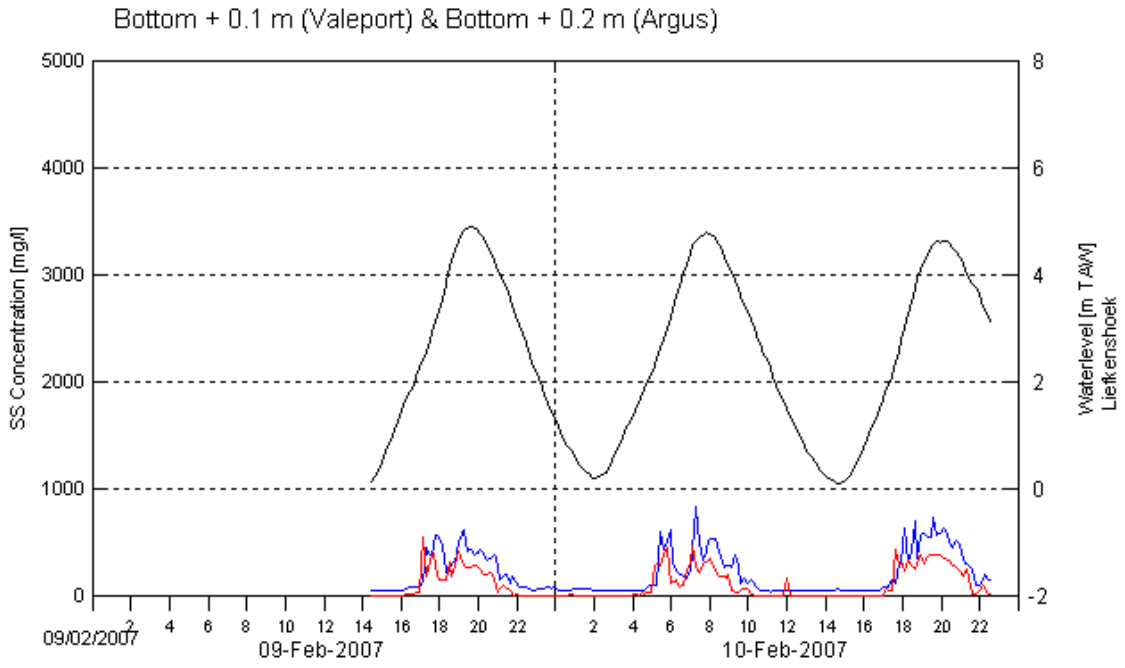
COMPARISON OF RCM9 & VALEPORT SENSORS

TO ARGUS SENSORS

E.1 Sill Frame

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

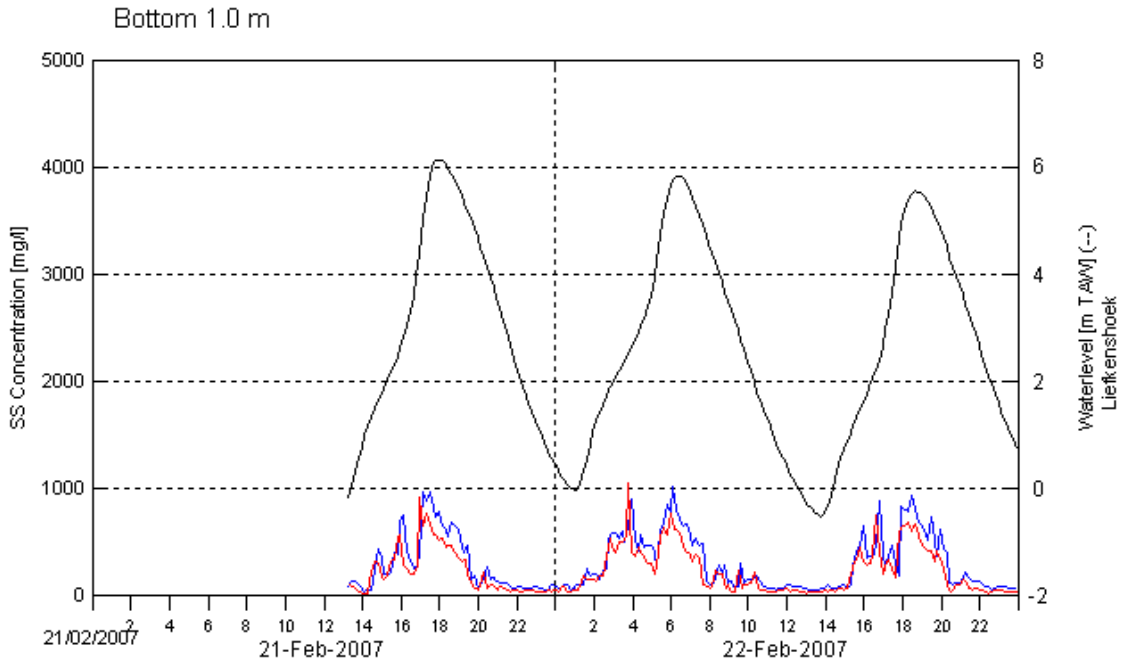
Date: 09/02/07 – 10/02/07

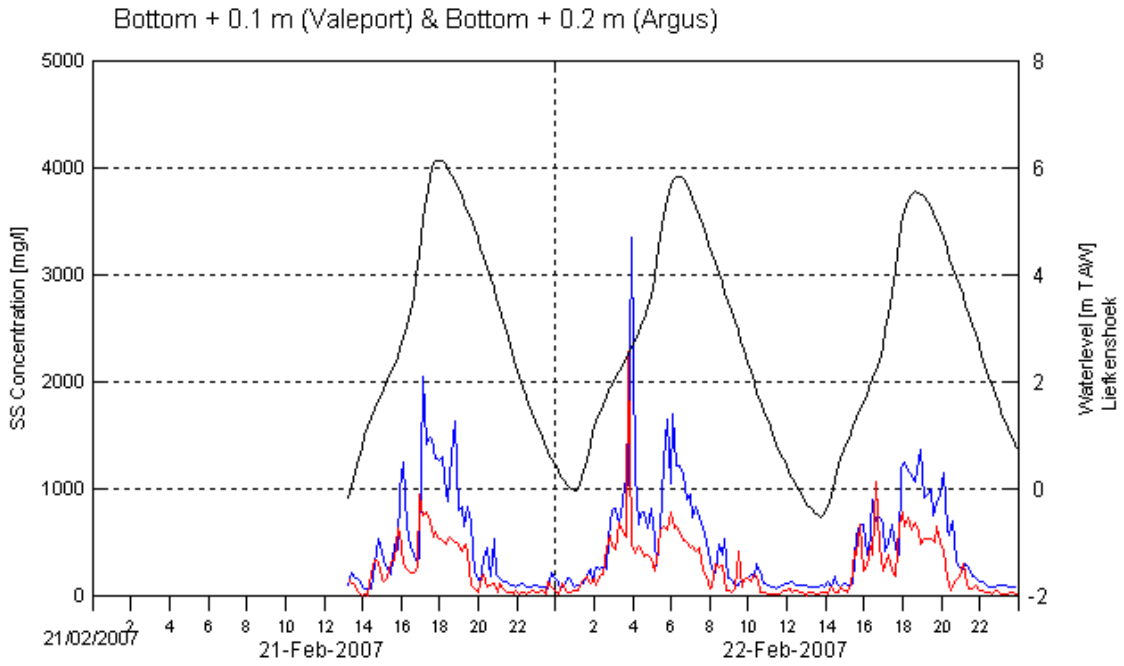
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

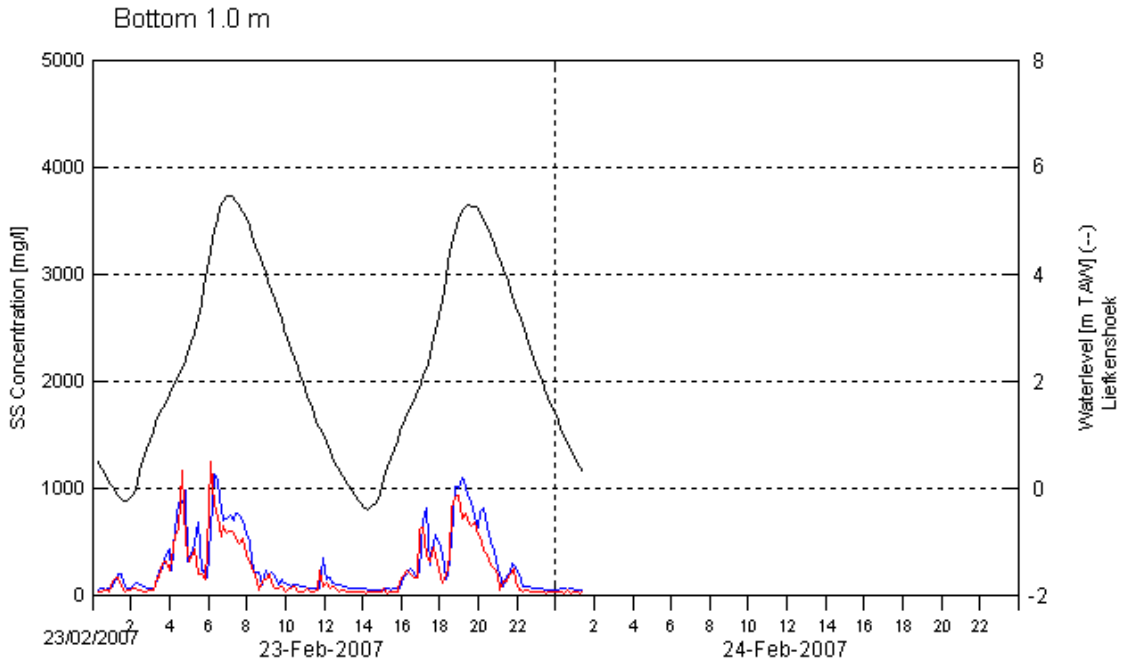
Date: 21/02/07 – 22/02/07

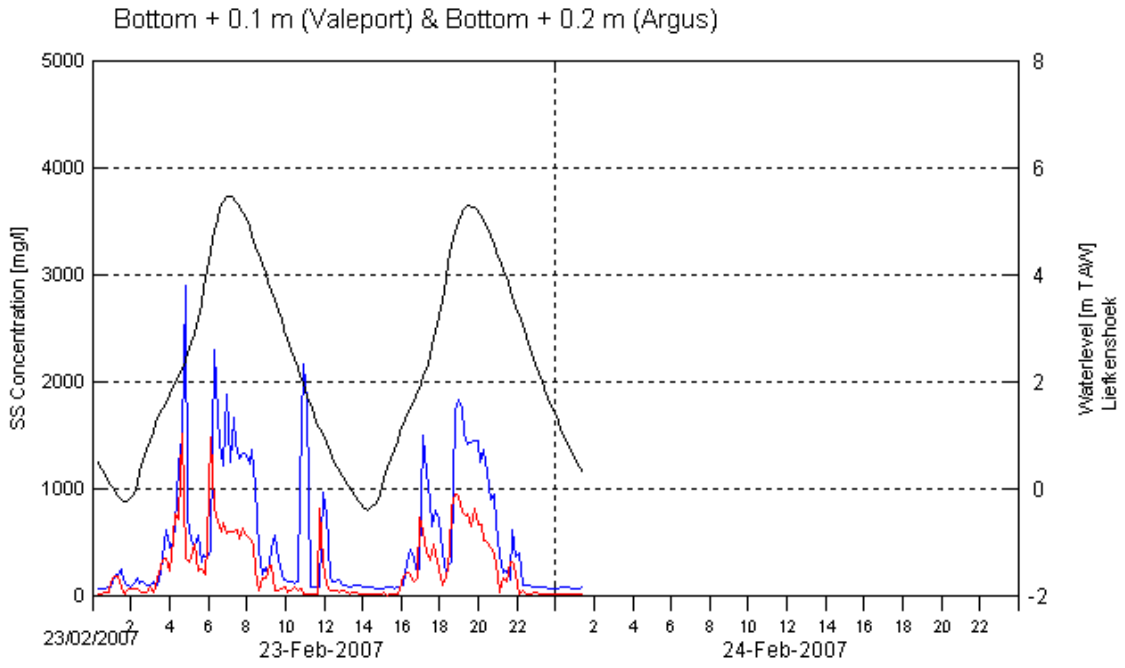
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

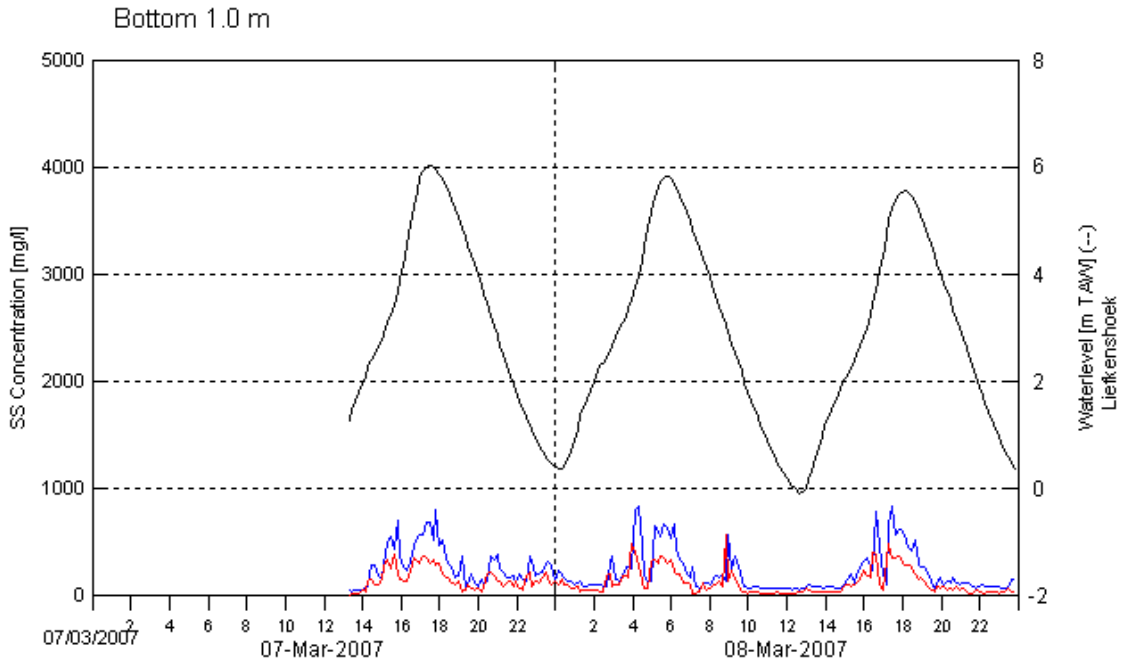
Date: 23/02/07 – 24/02/07

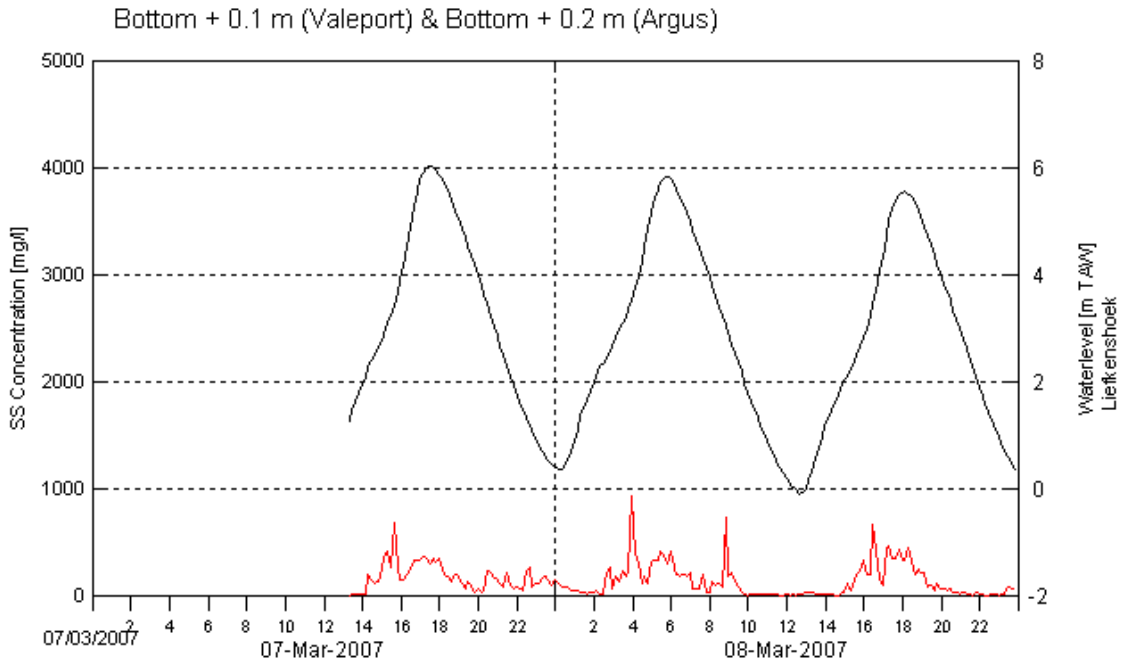
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

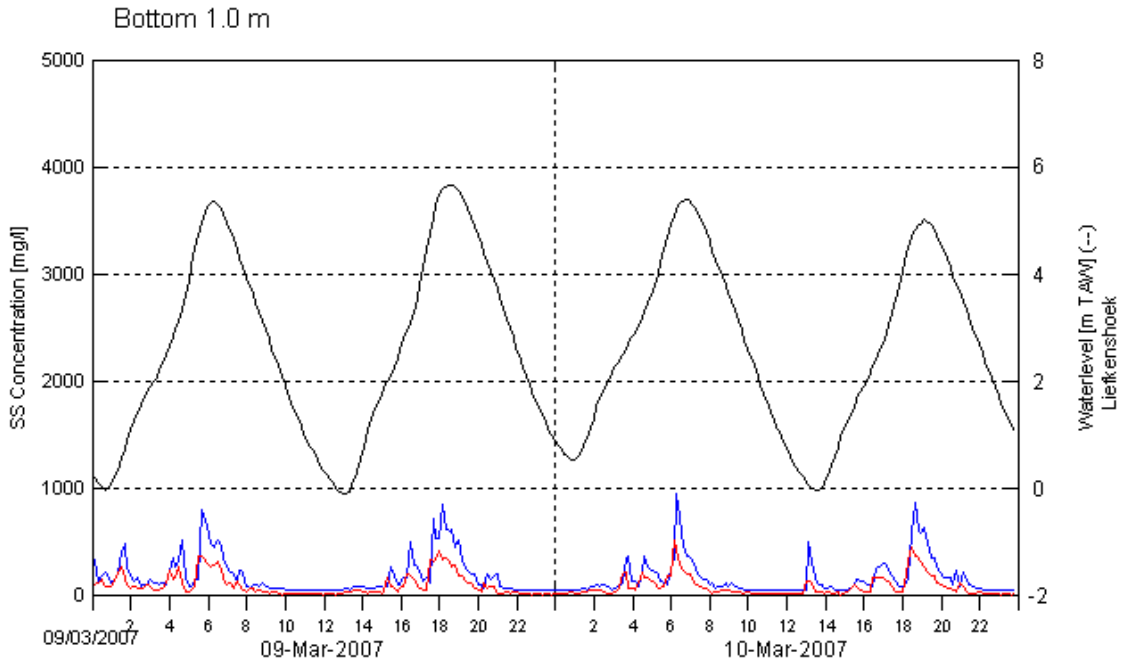
Date: 07/03/07 – 08/03/07

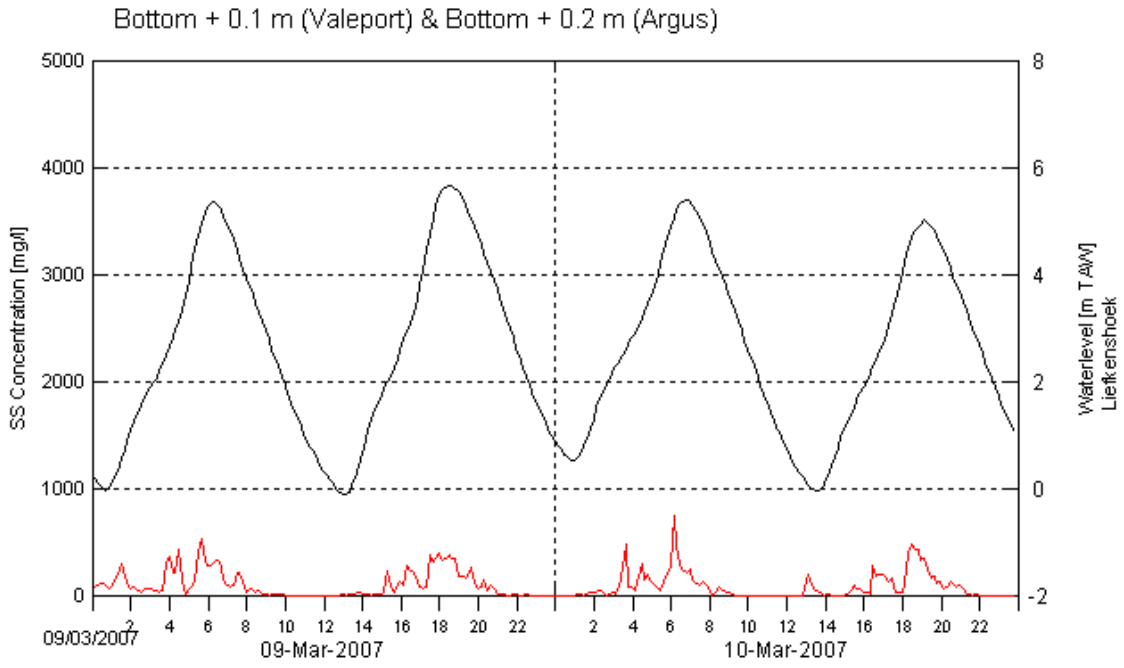
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

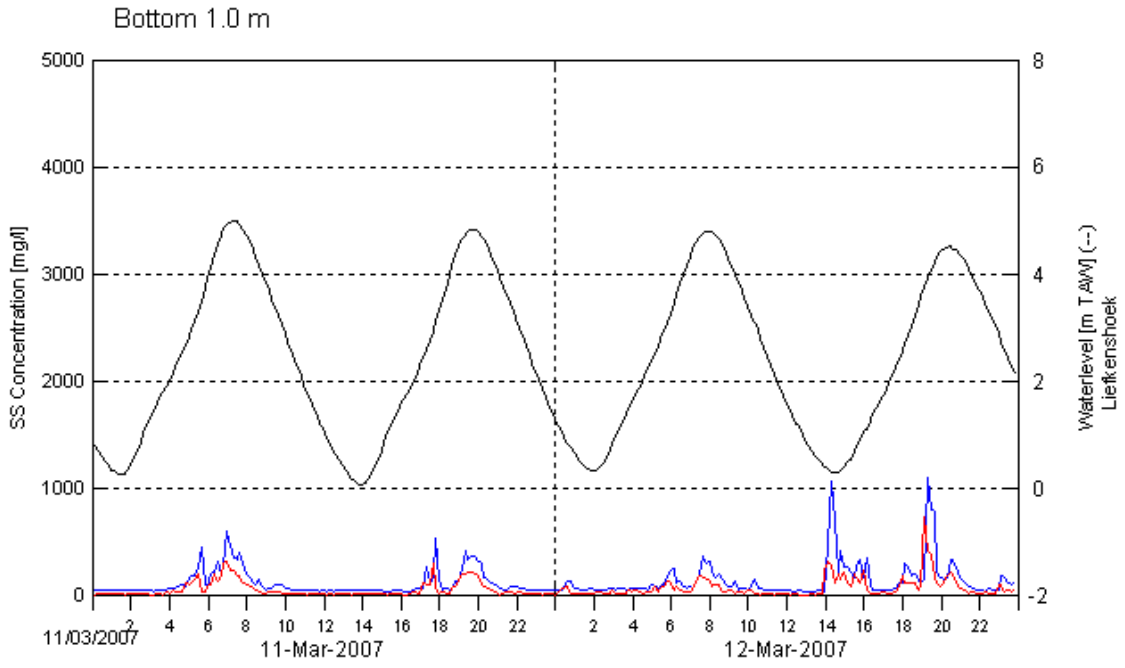
Date: 09/03/07 – 10/03/07

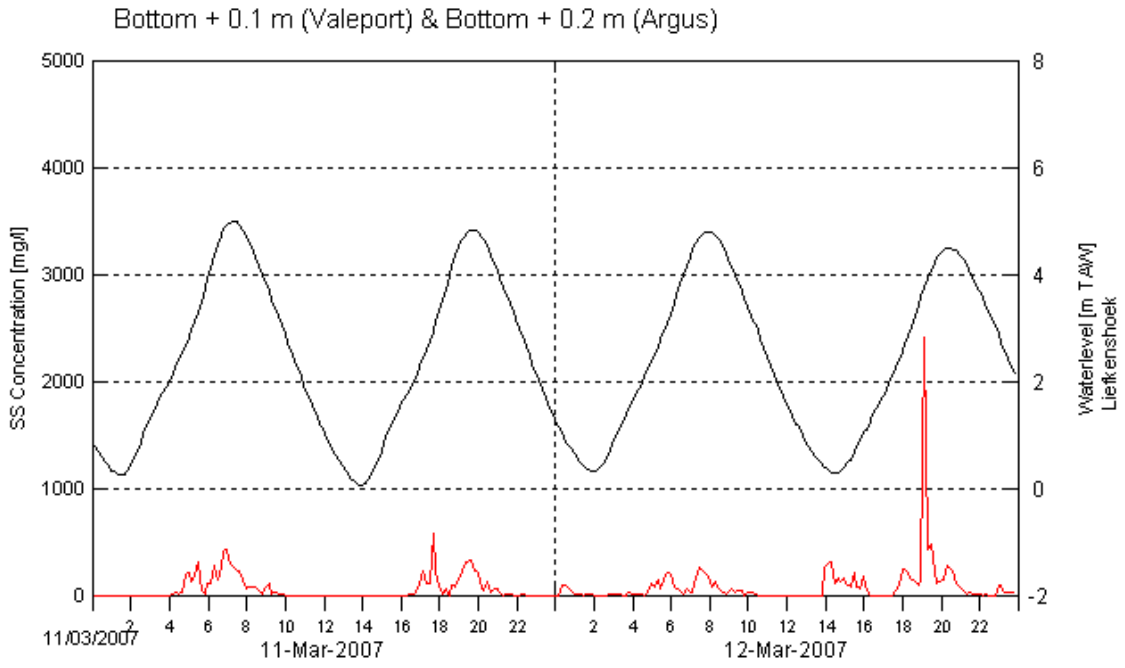
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

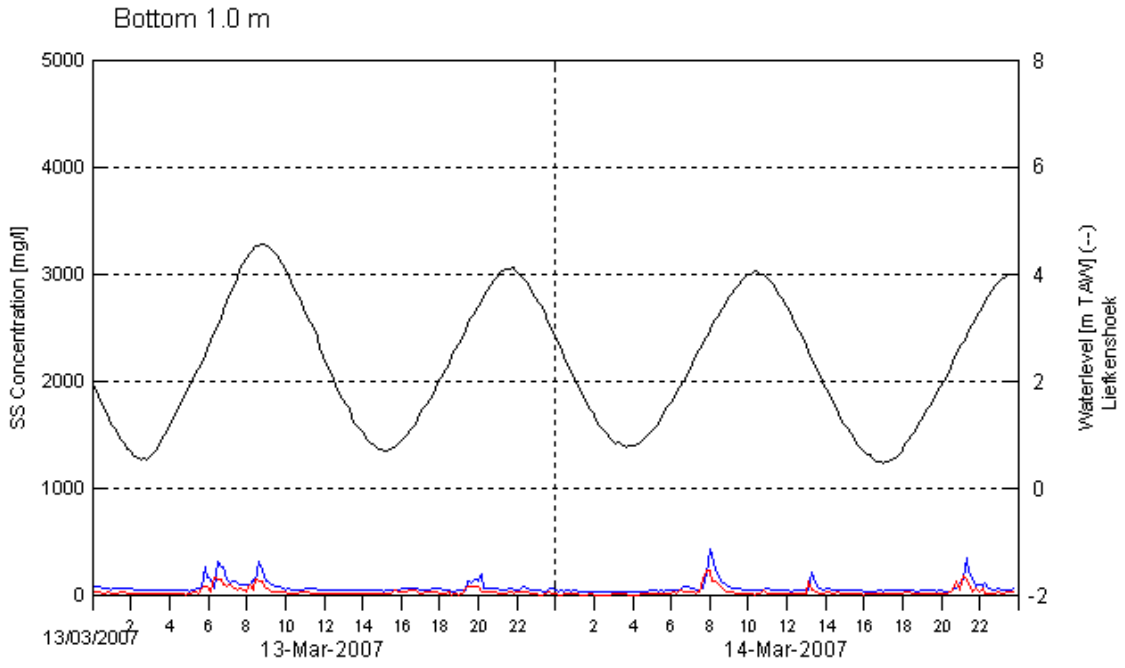
Date: 11/03/07 – 12/03/07

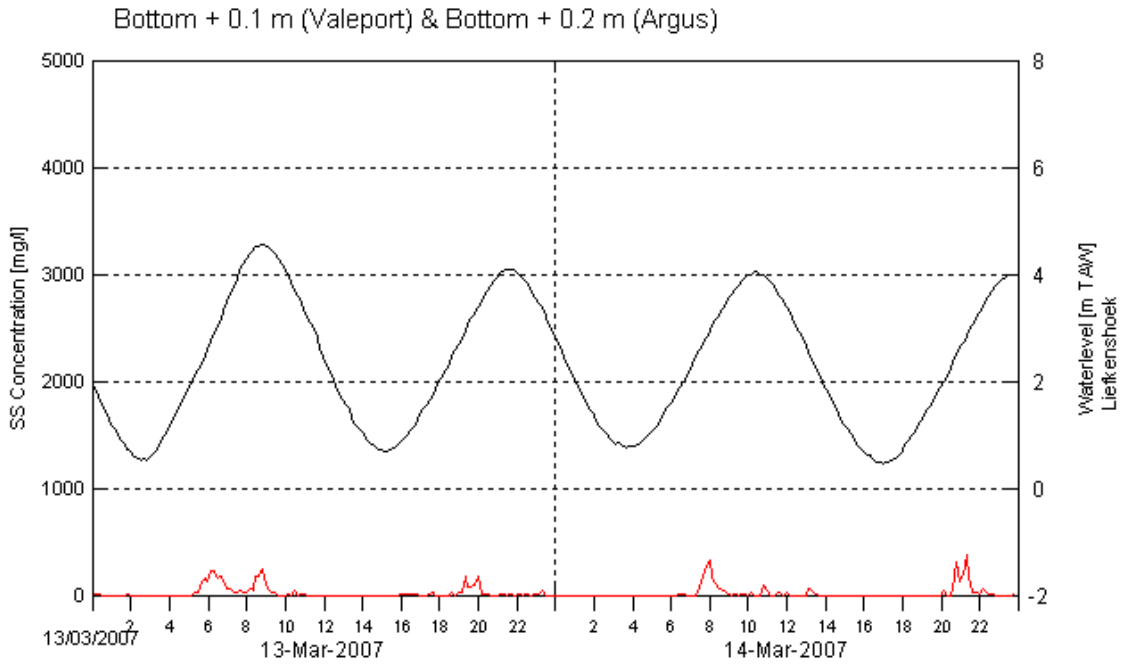
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

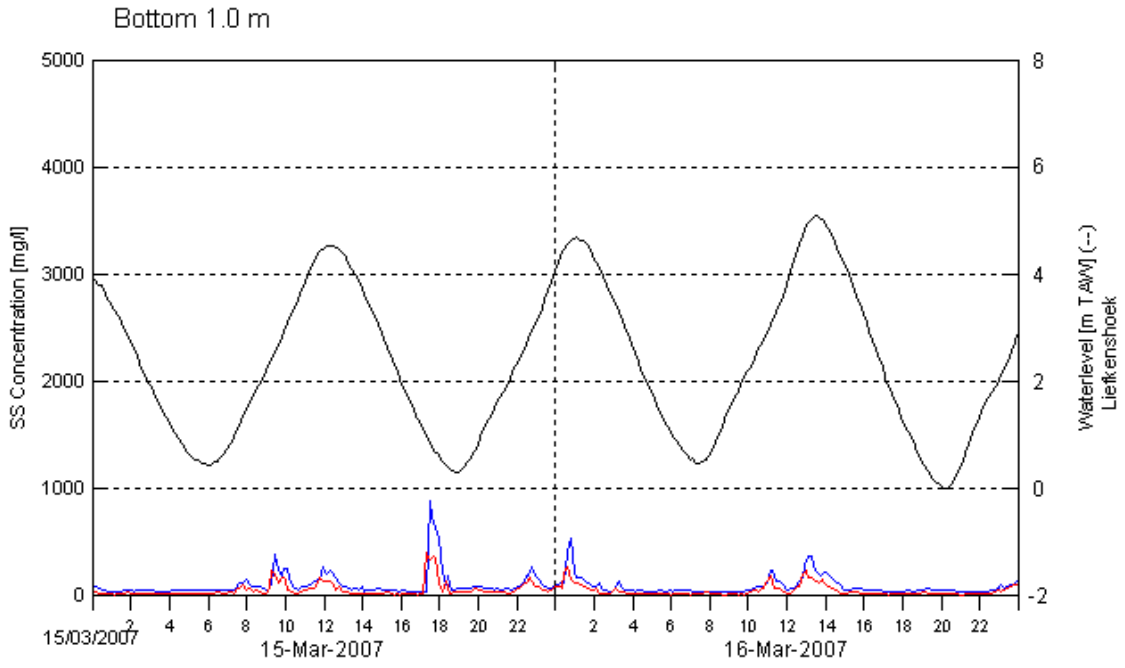
Date: 13/03/07 – 14/03/07

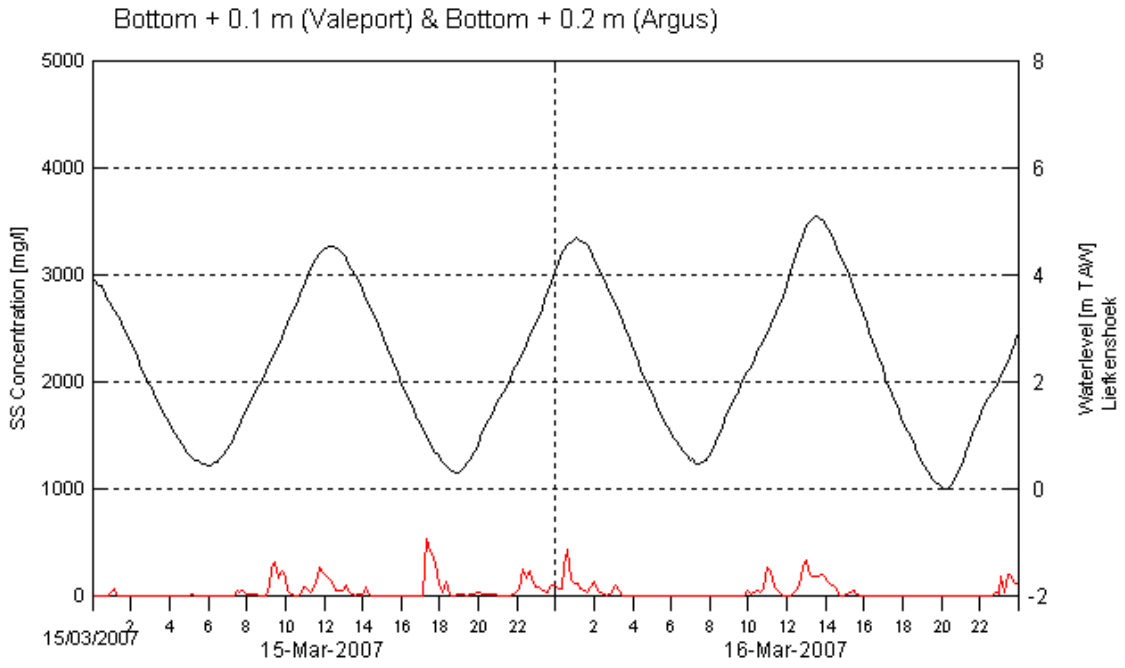
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

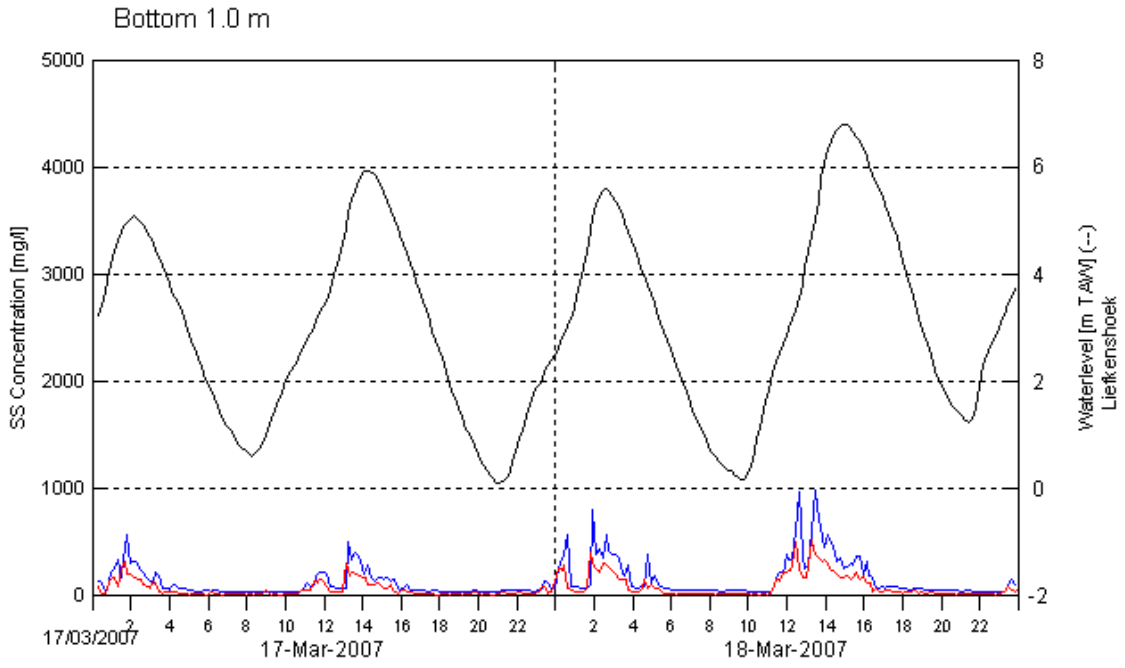
Date: 15/03/07 – 16/03/07

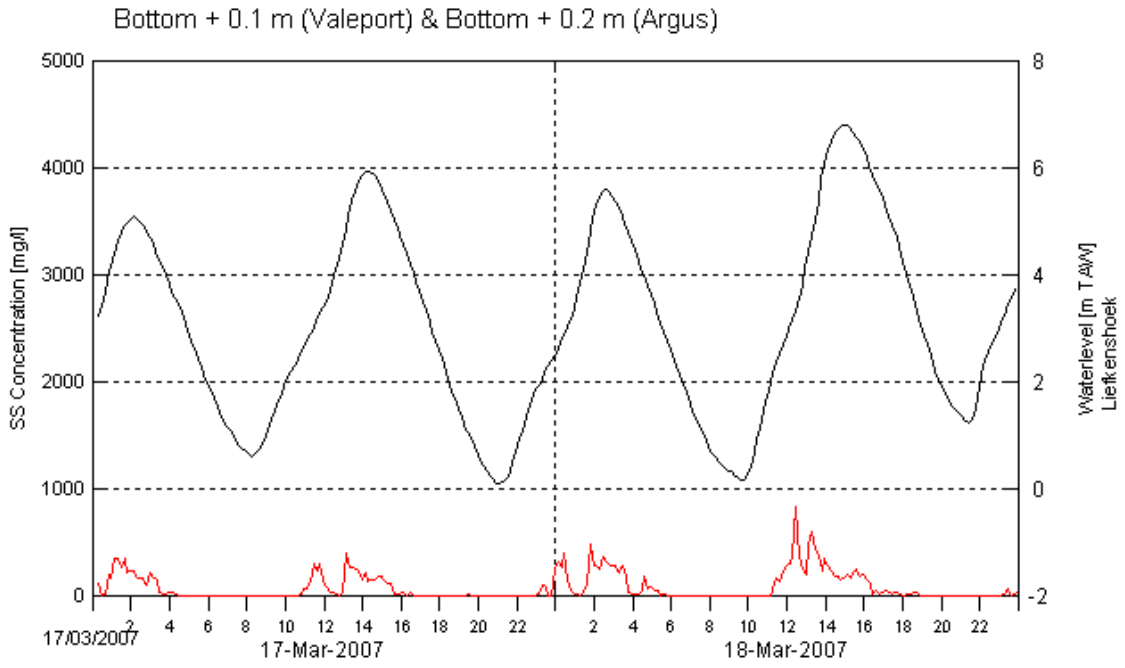
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

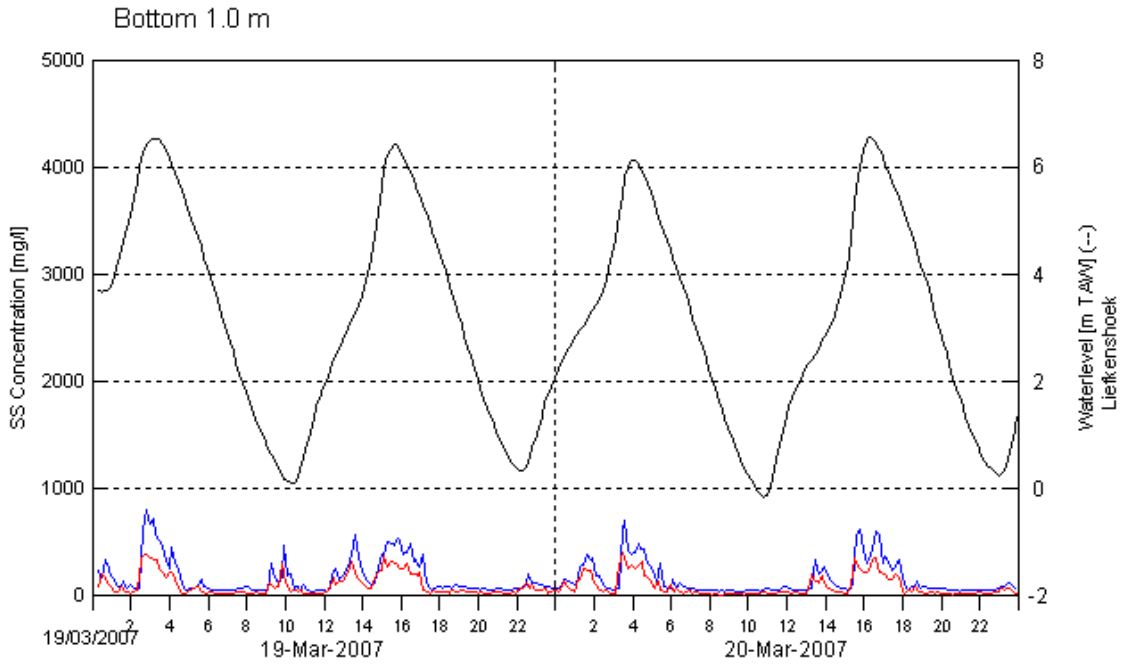
Date: 17/03/07 – 18/03/07

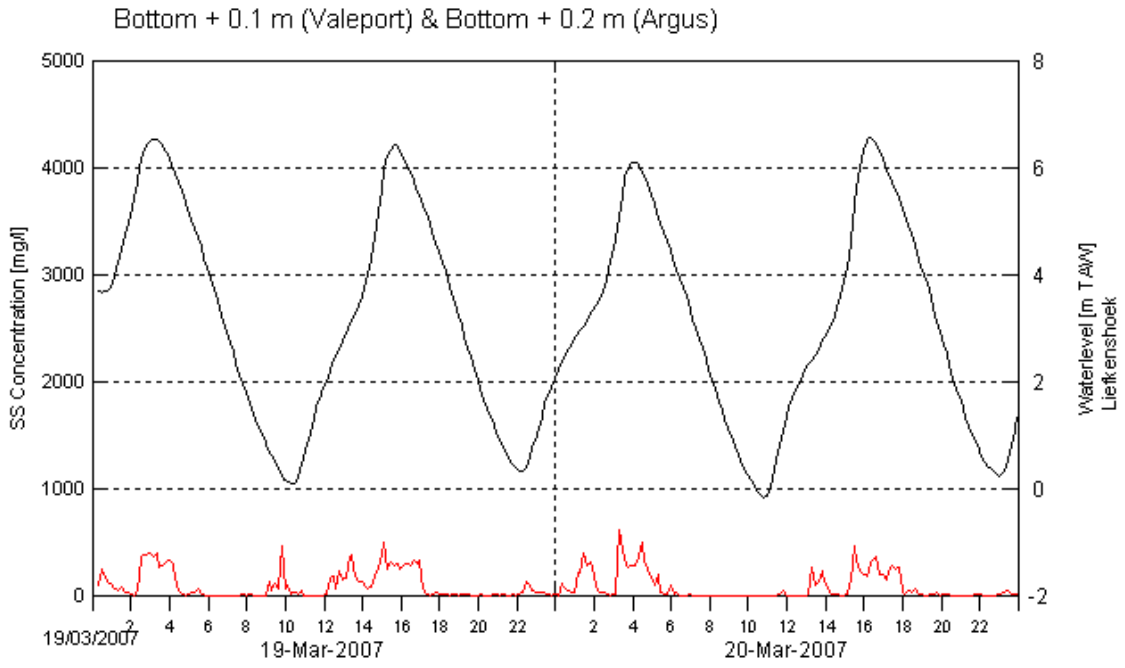
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

Date: 19/03/07 – 20/03/07

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

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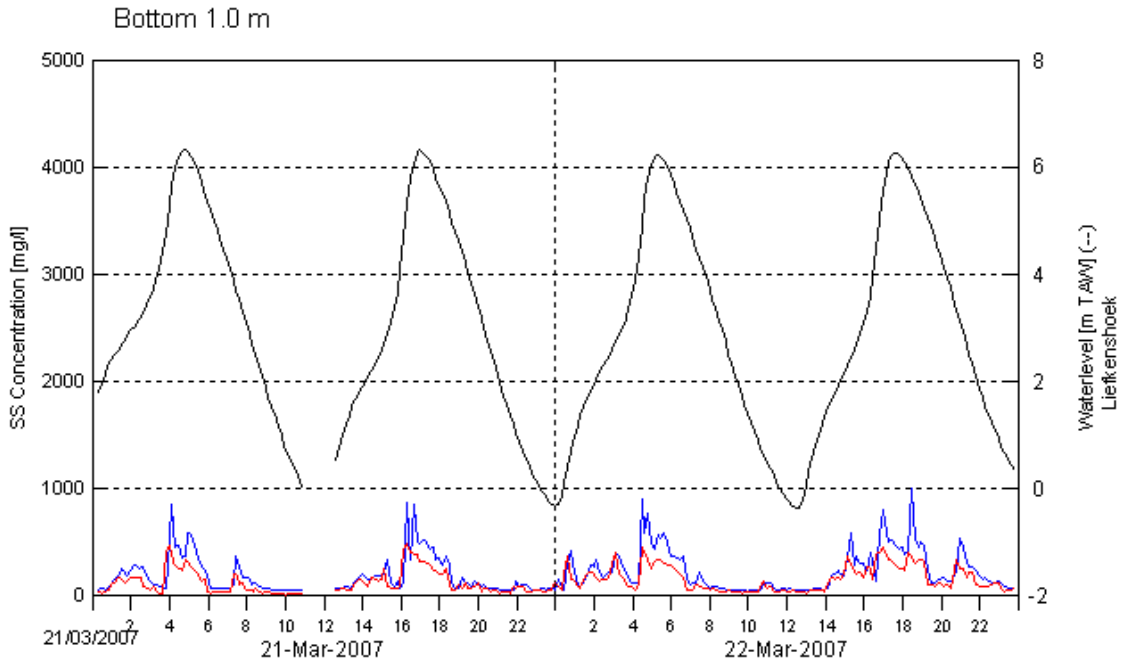
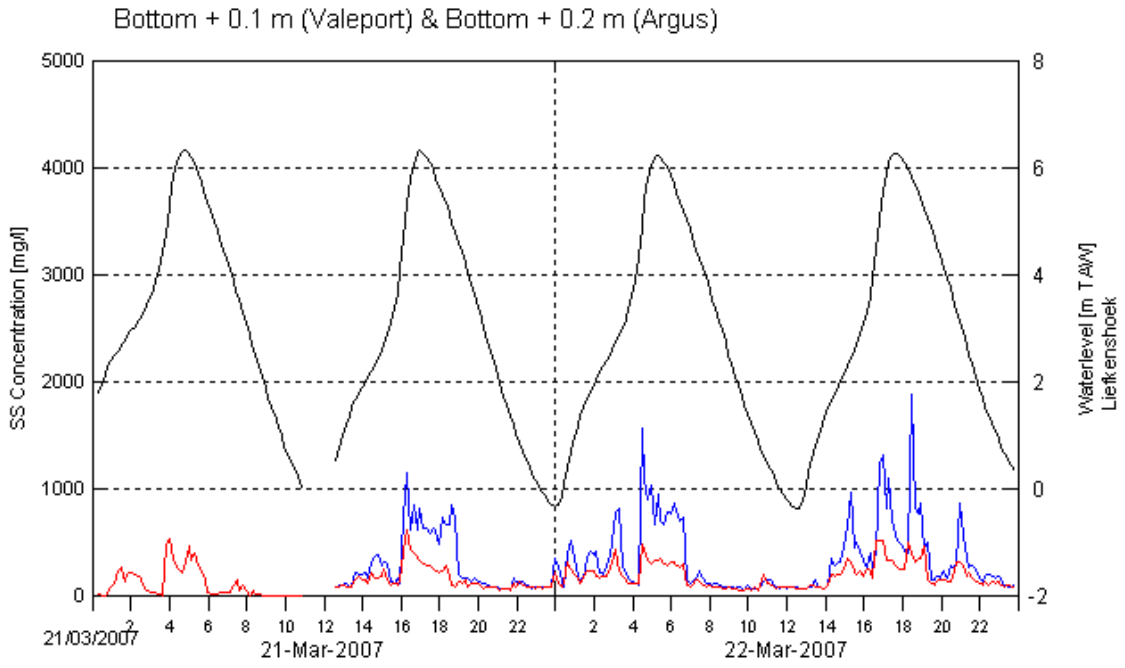
11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

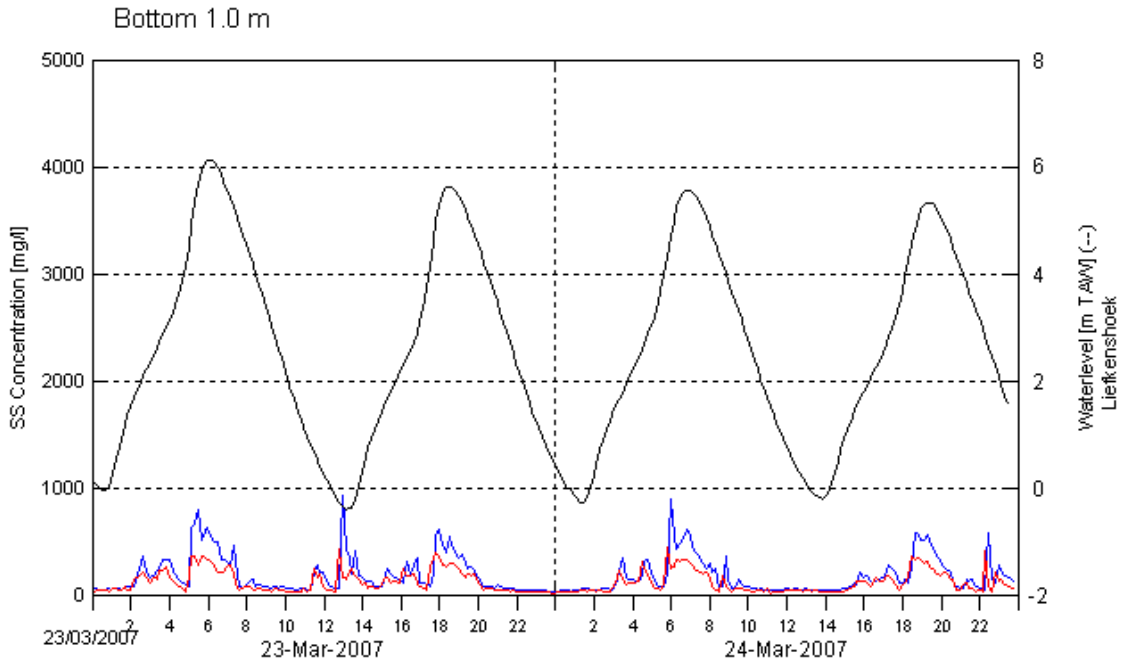
Date: 21/03/07 – 22/03/07

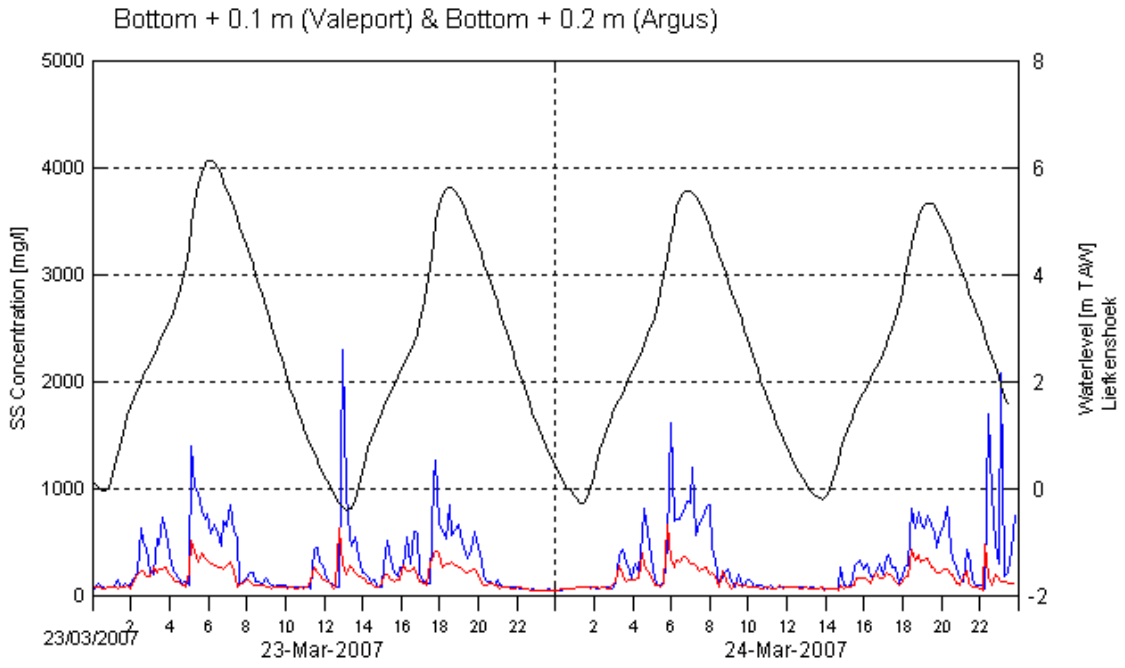
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

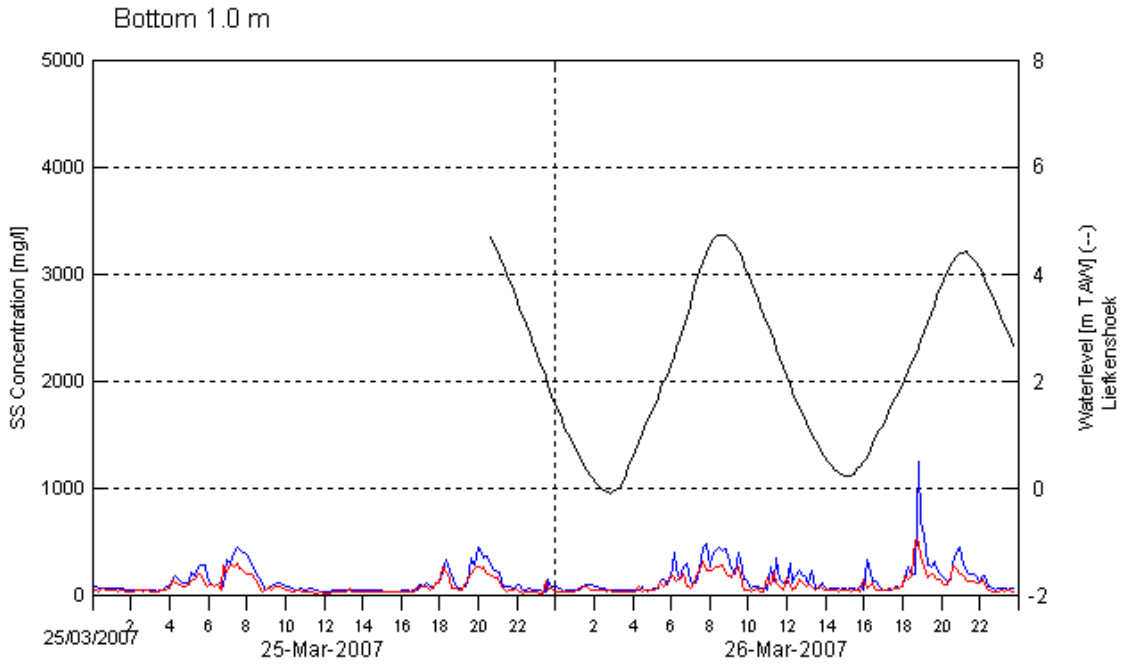
Date: 23/03/07 – 24/03/07

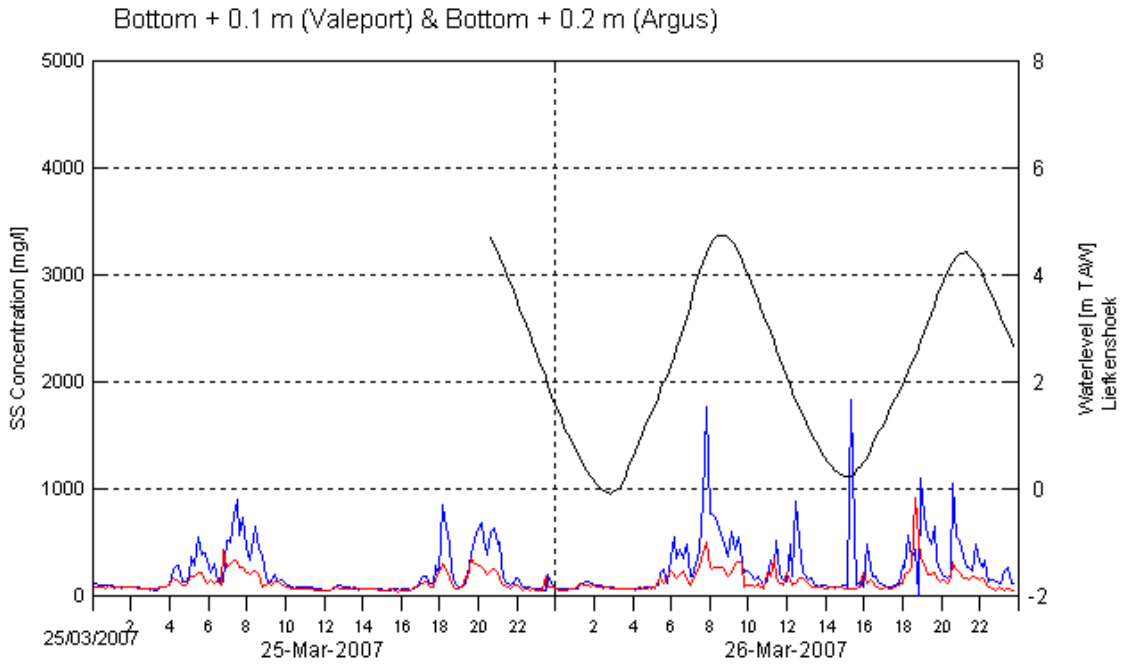
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

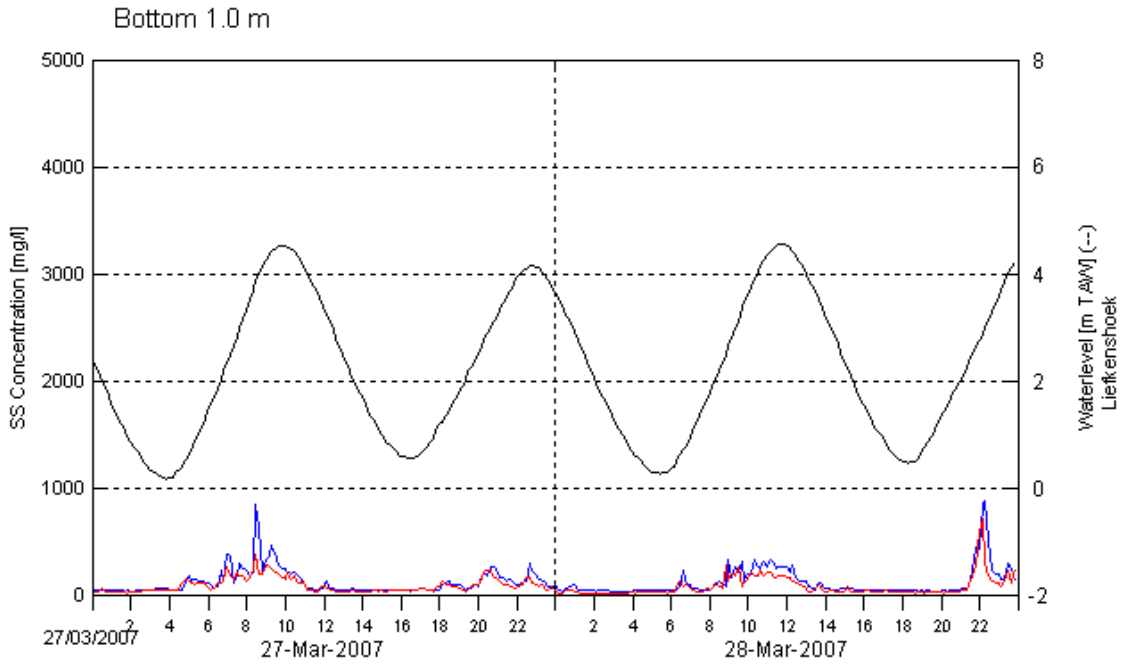
Date: 25/03/07 – 26/03/07

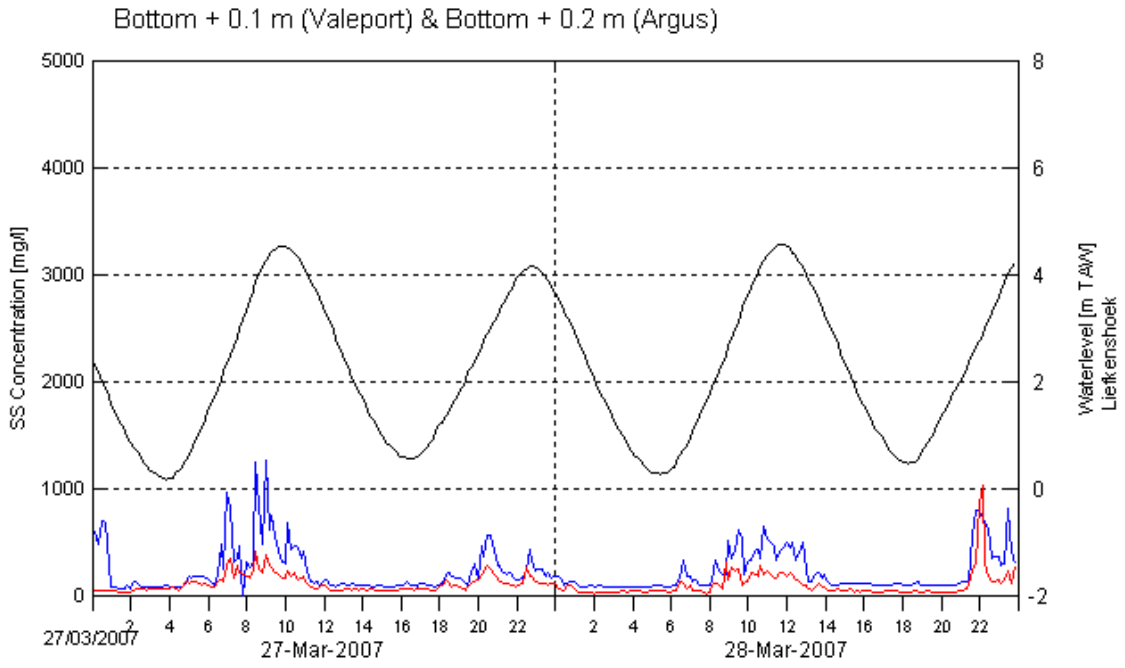
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

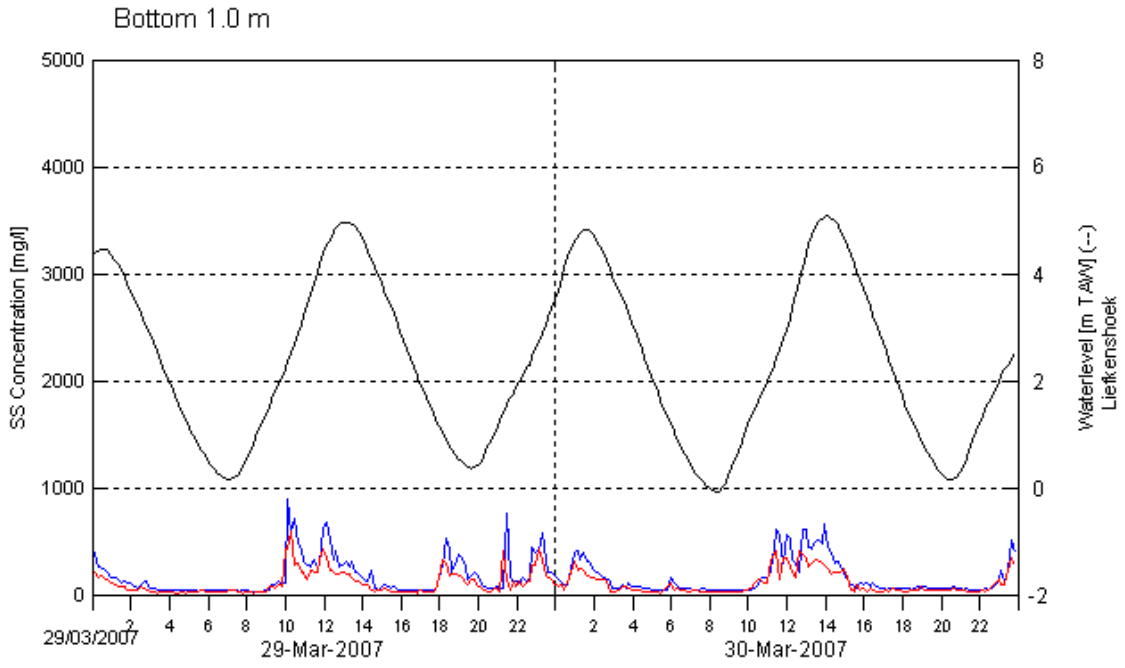
Date: 27/03/07 – 28/03/07

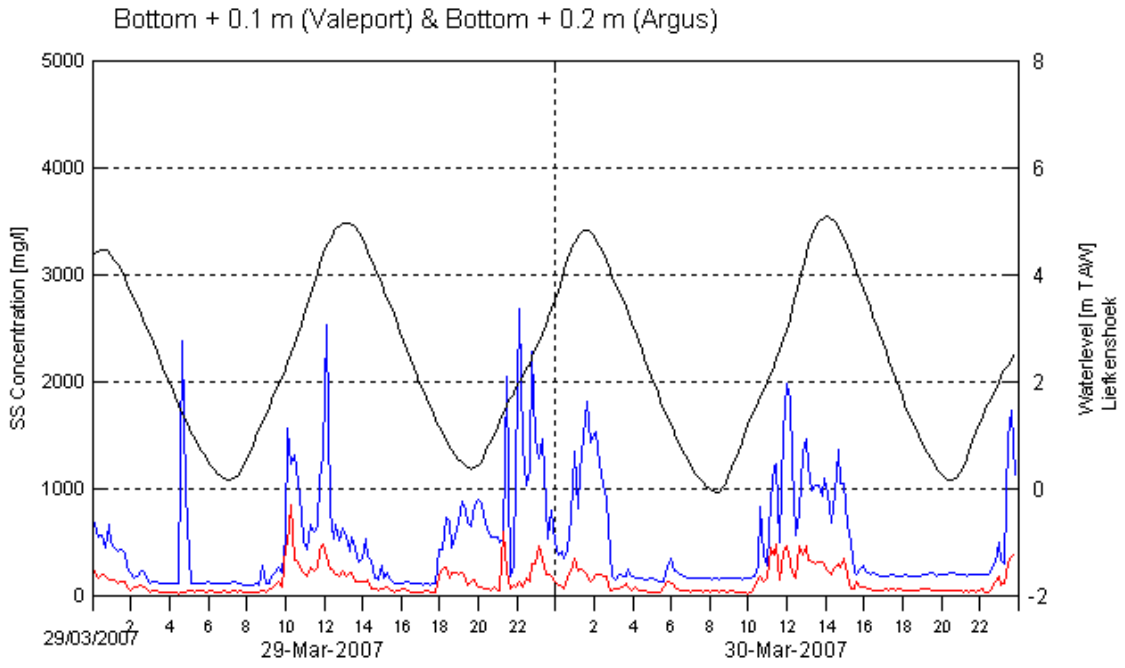
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

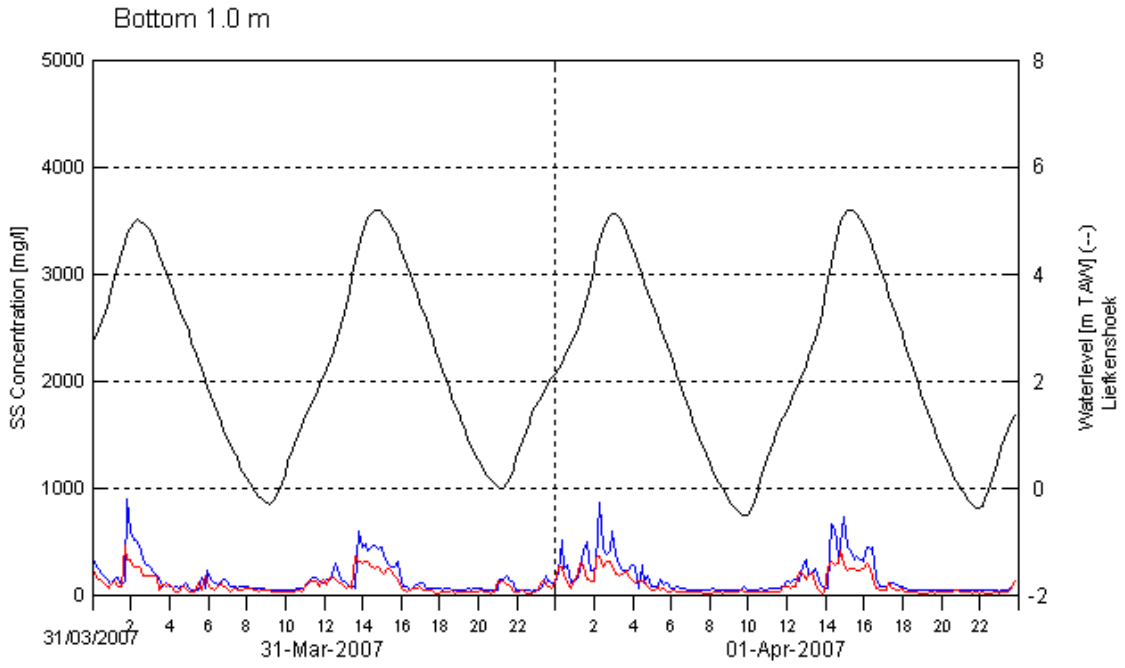
Date: 29/03/07 – 30/03/07

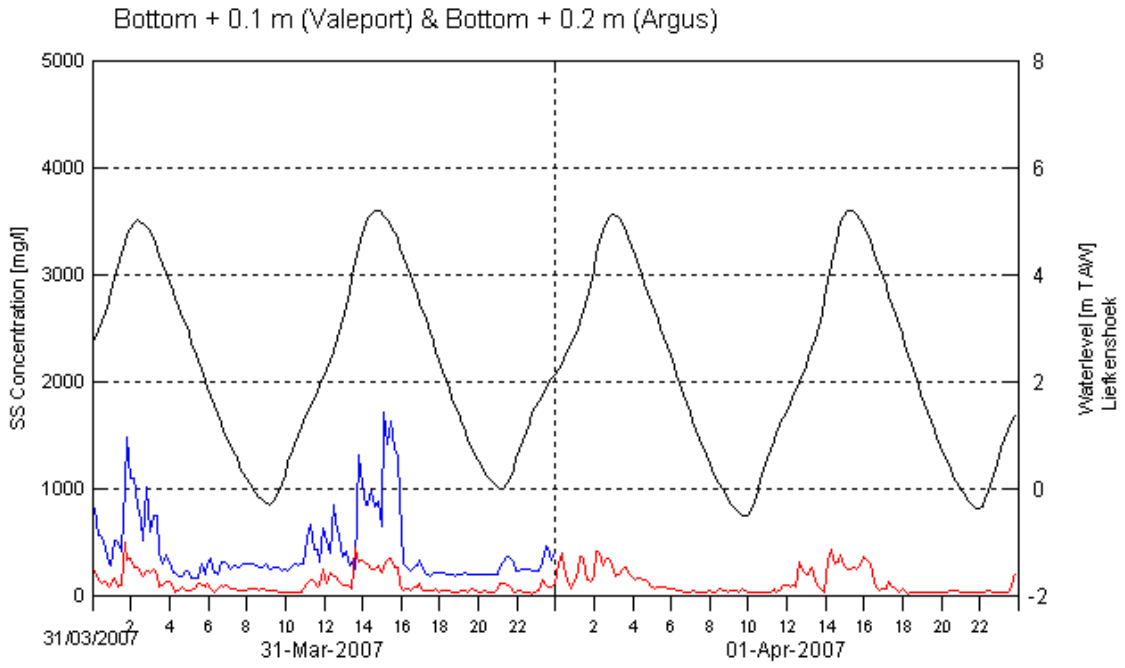
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

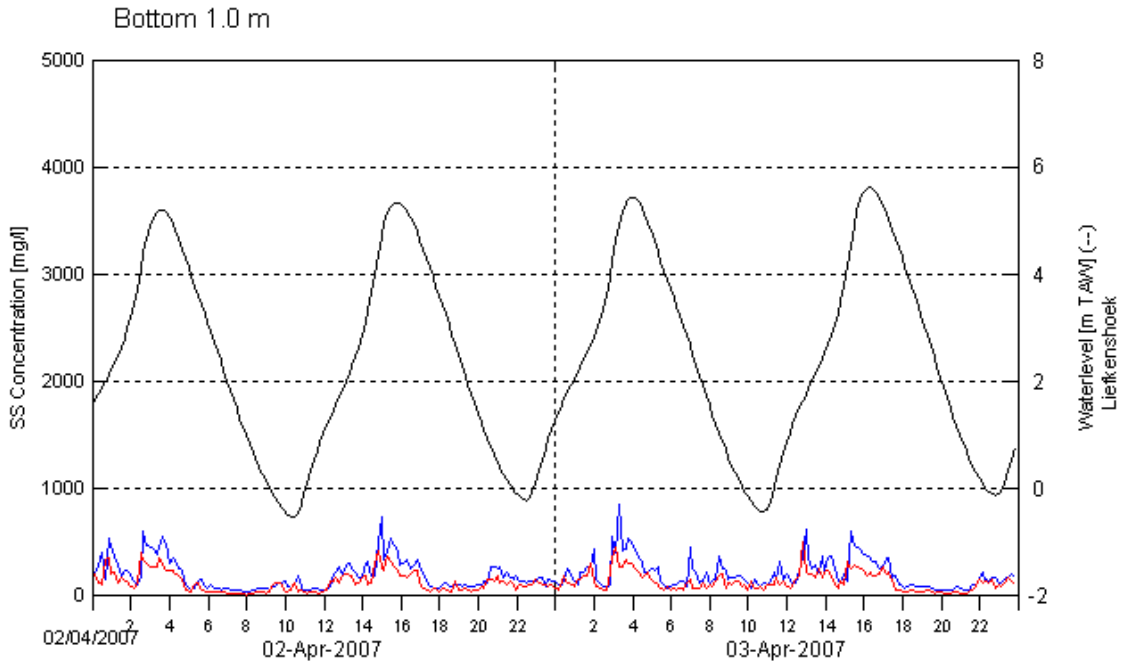
Date: 31/03/07 – 01/04/07

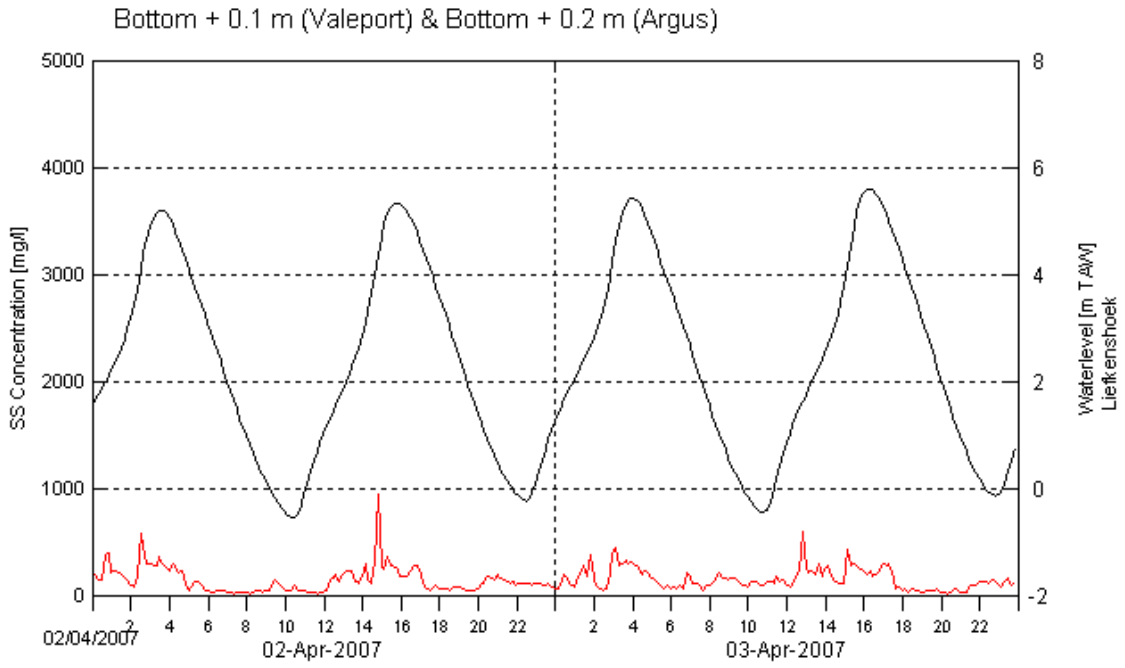
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

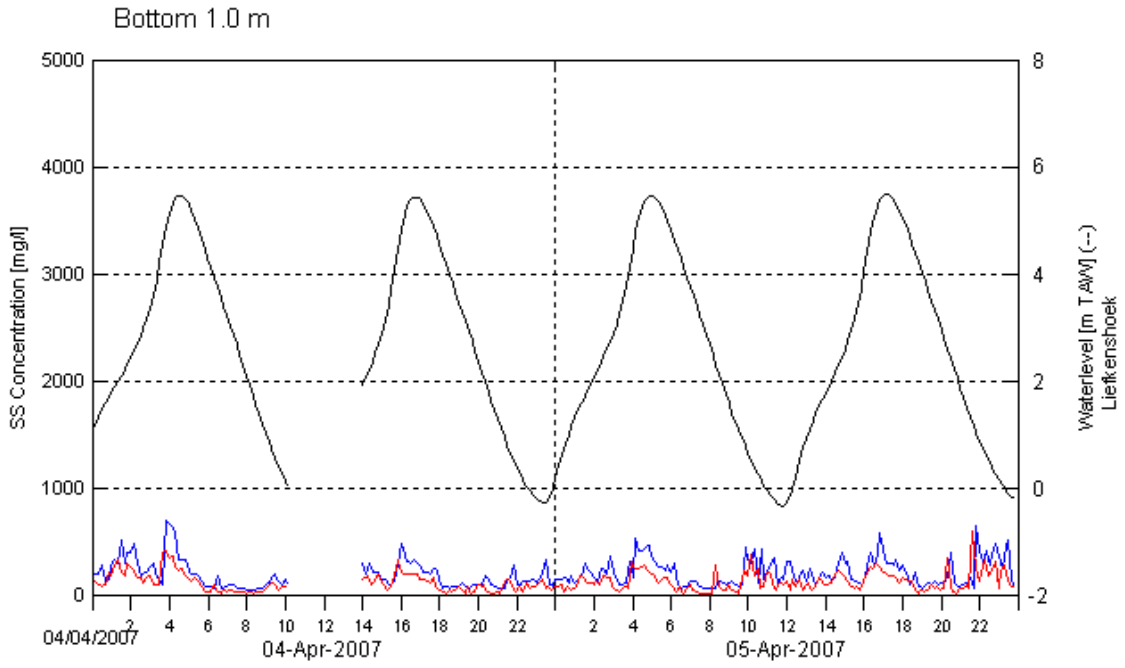
Date: 02/04/07 – 03/04/07

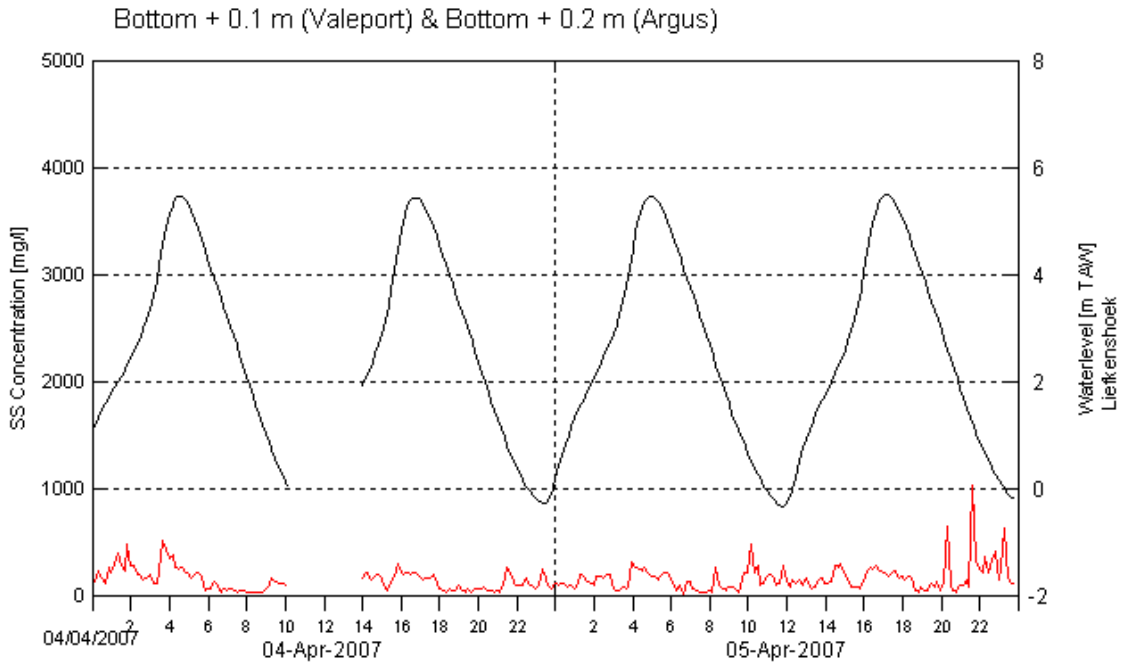
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

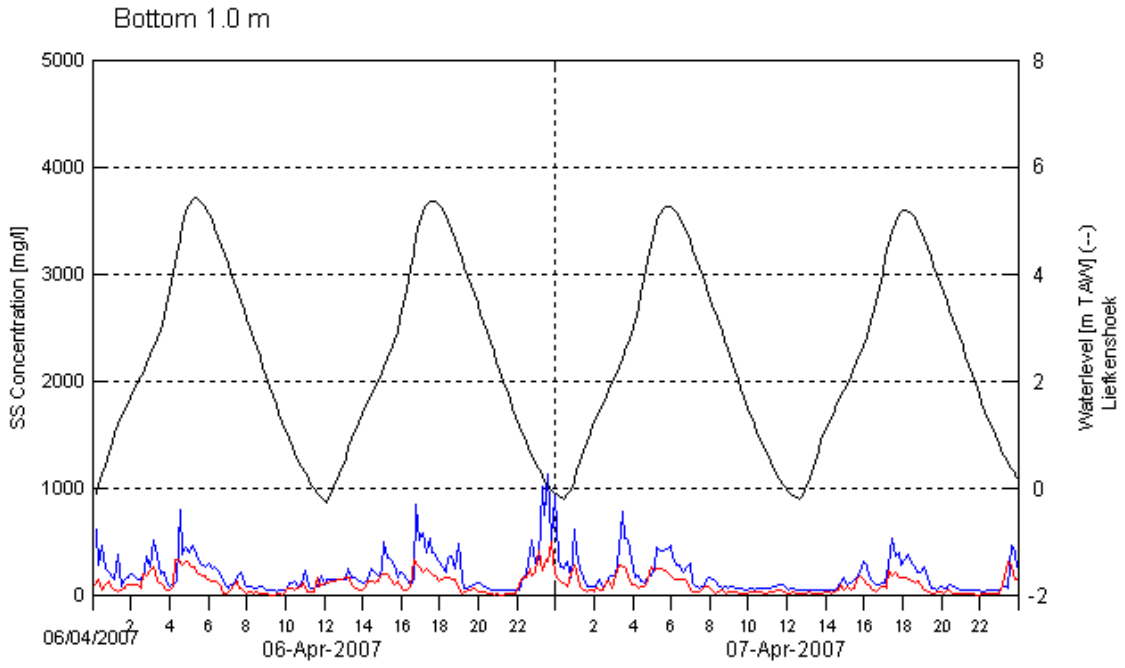
Date: 04/04/07 – 05/04/07

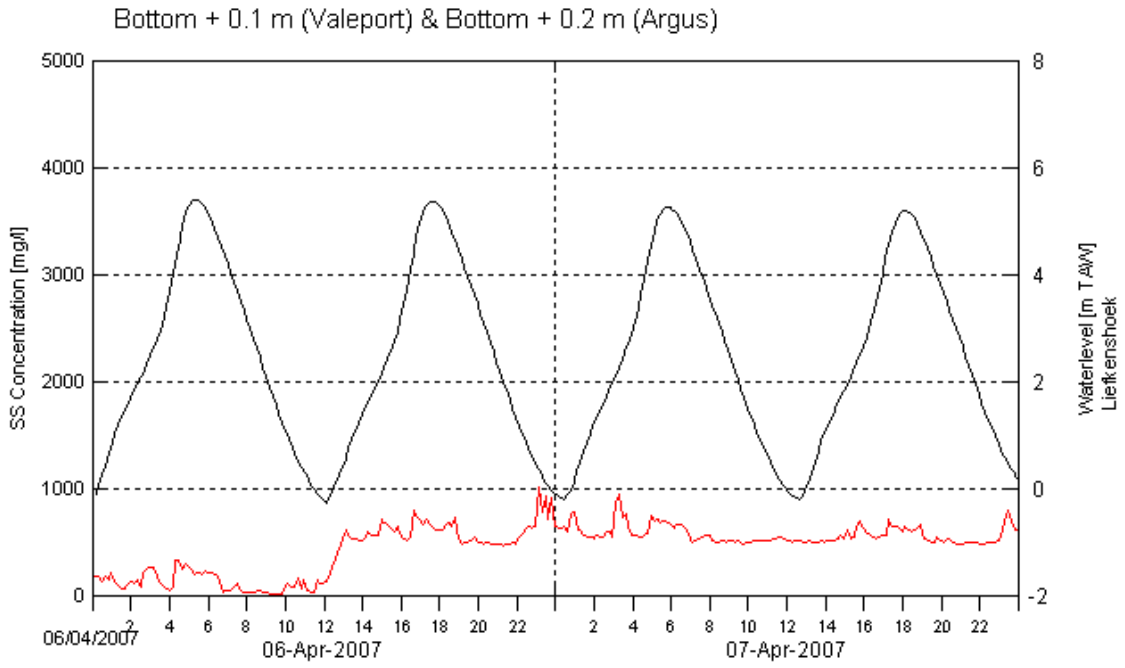
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

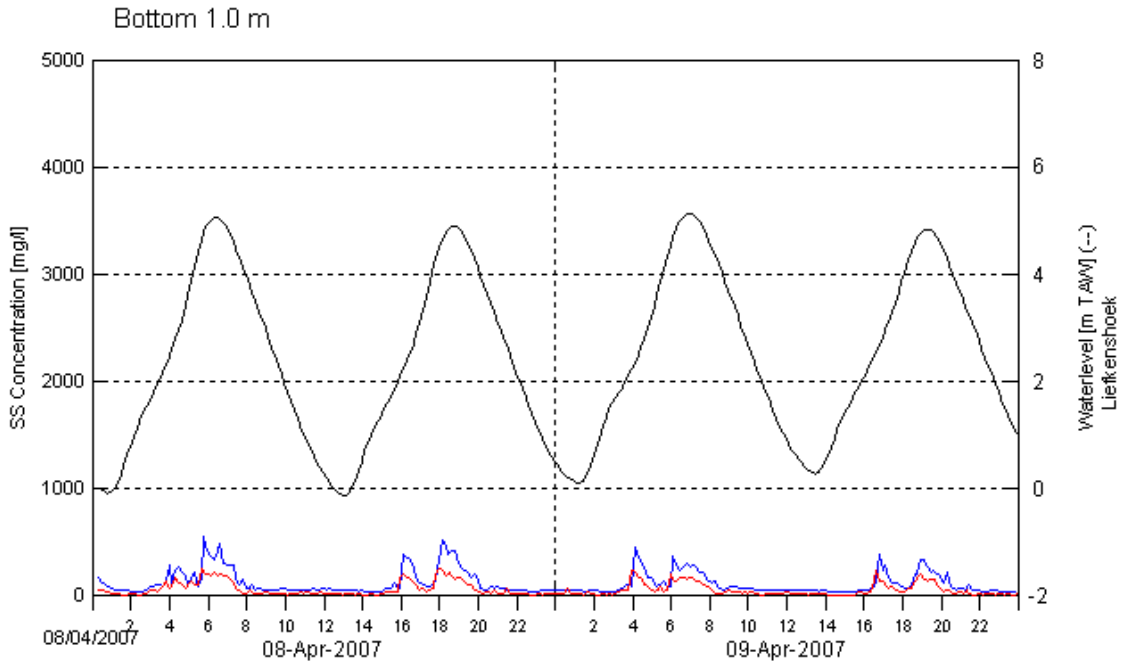
Date: 06/04/07 – 07/04/07

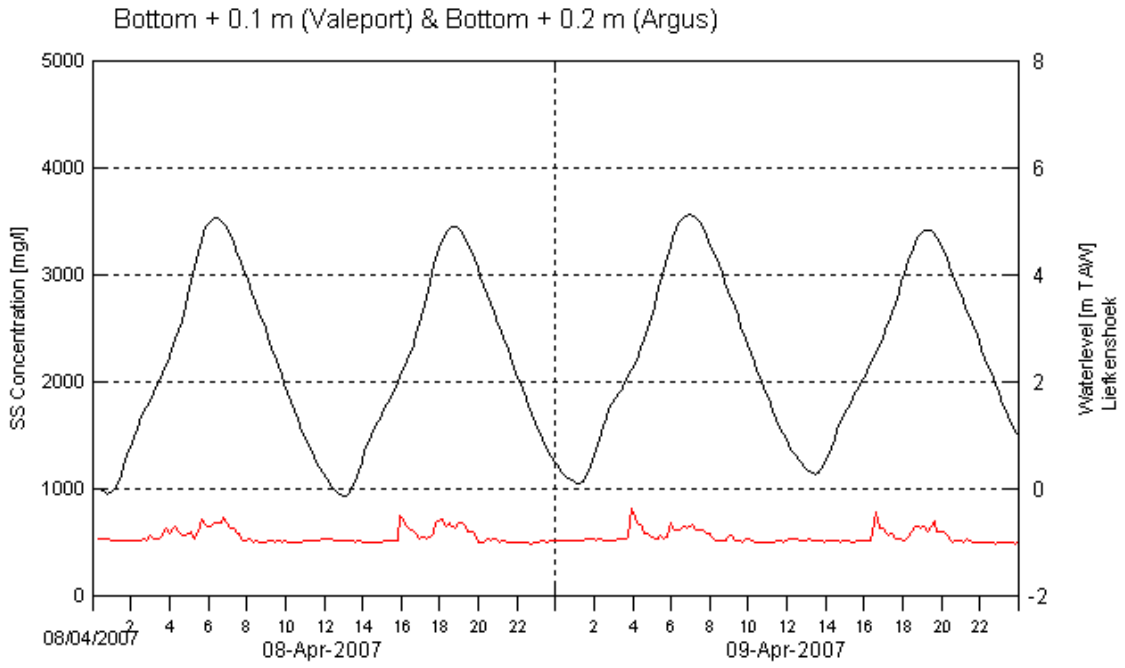
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

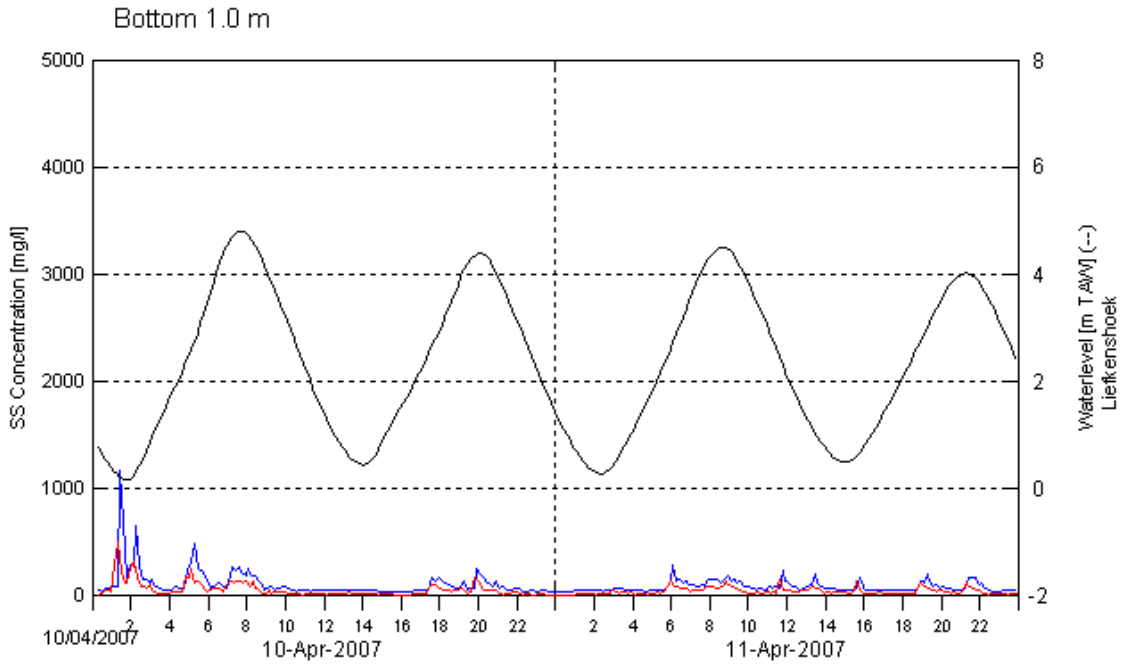
Date: 08/04/07 – 09/04/07

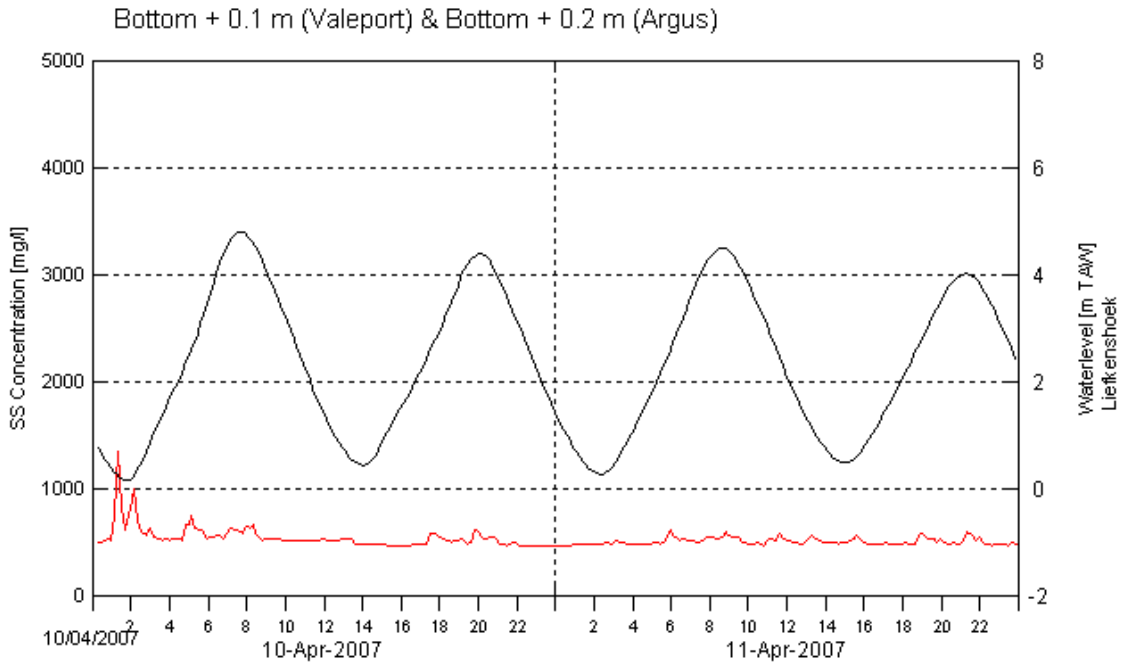
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

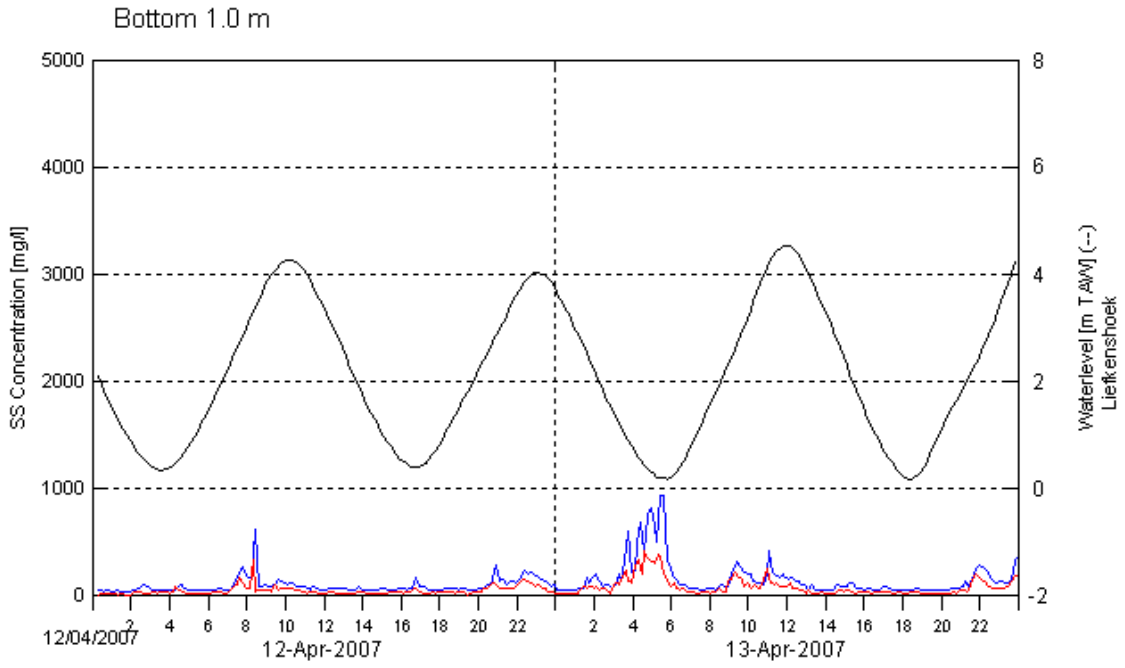
Date: 10/04/07 – 11/04/07

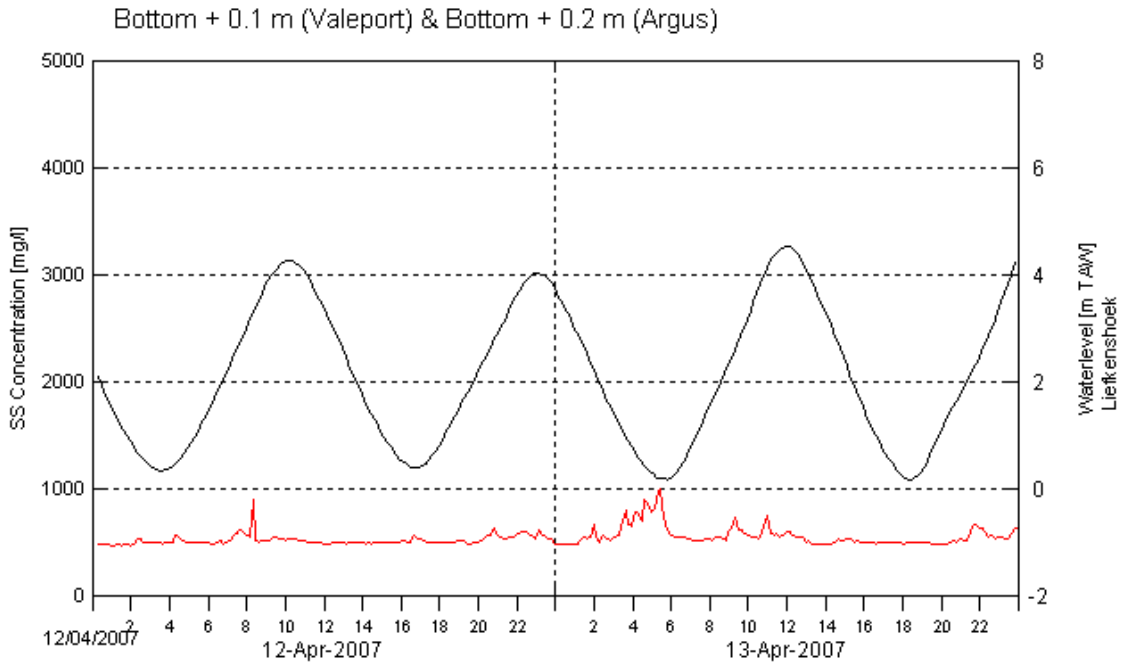
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

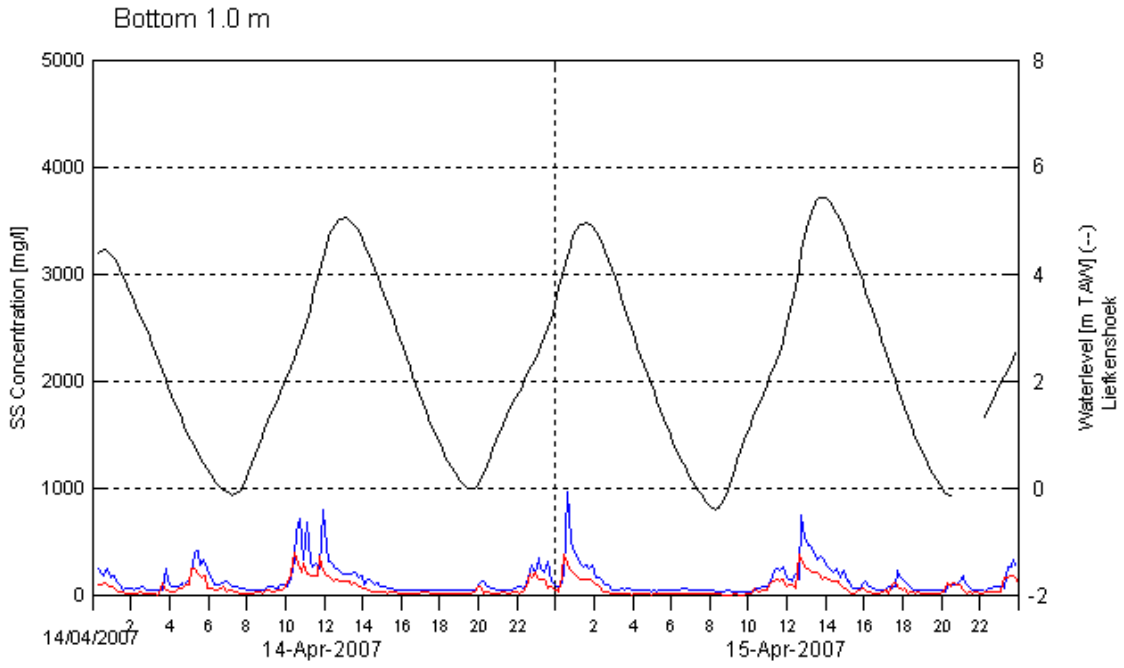
Date: 12/04/07 – 13/04/07

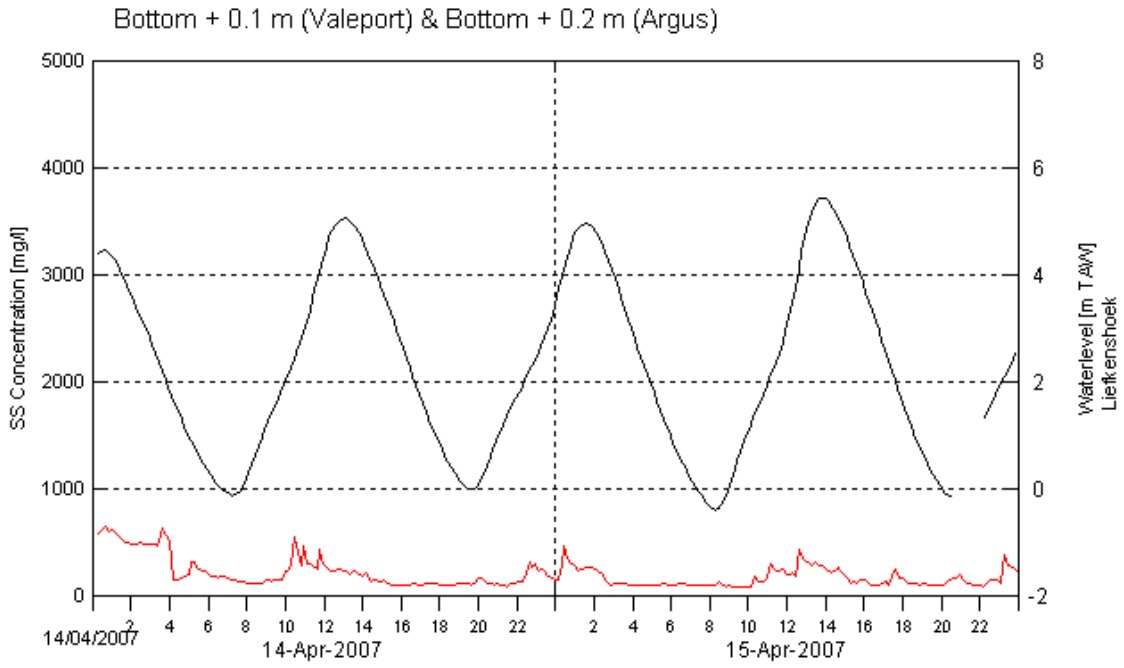
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

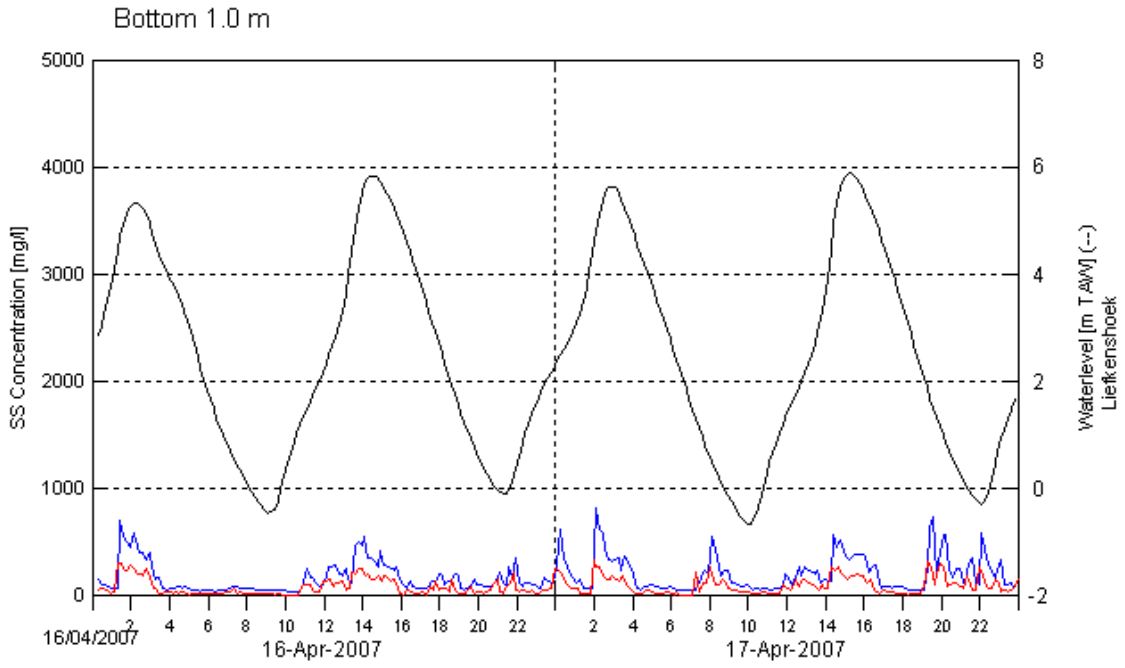
Date: 14/04/07 – 15/04/07

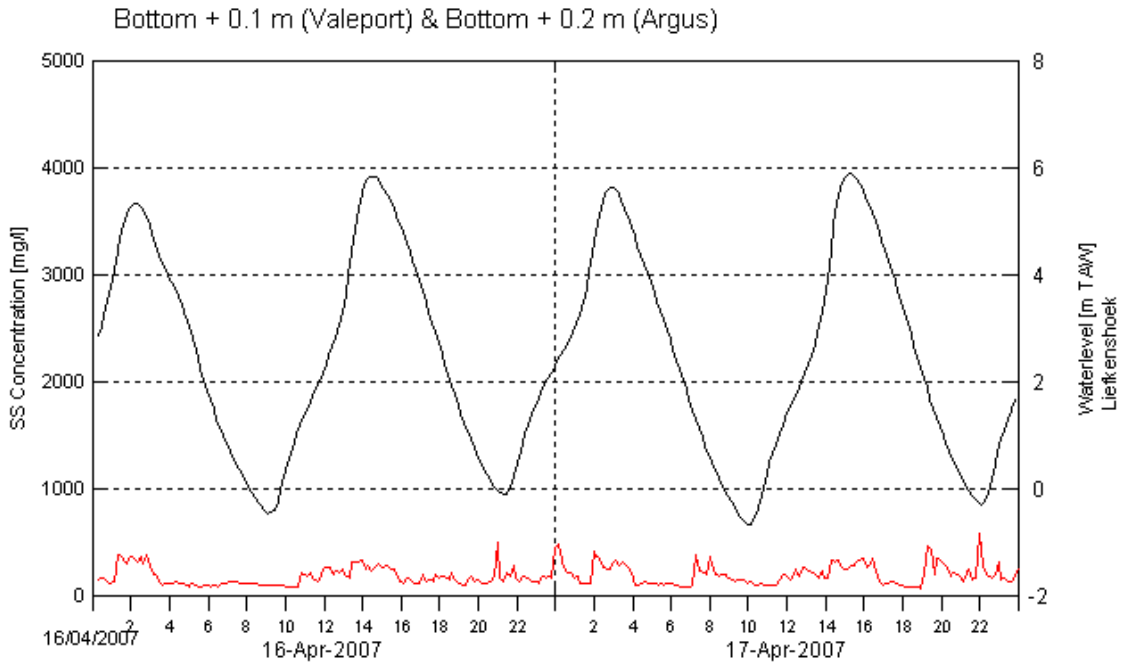
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

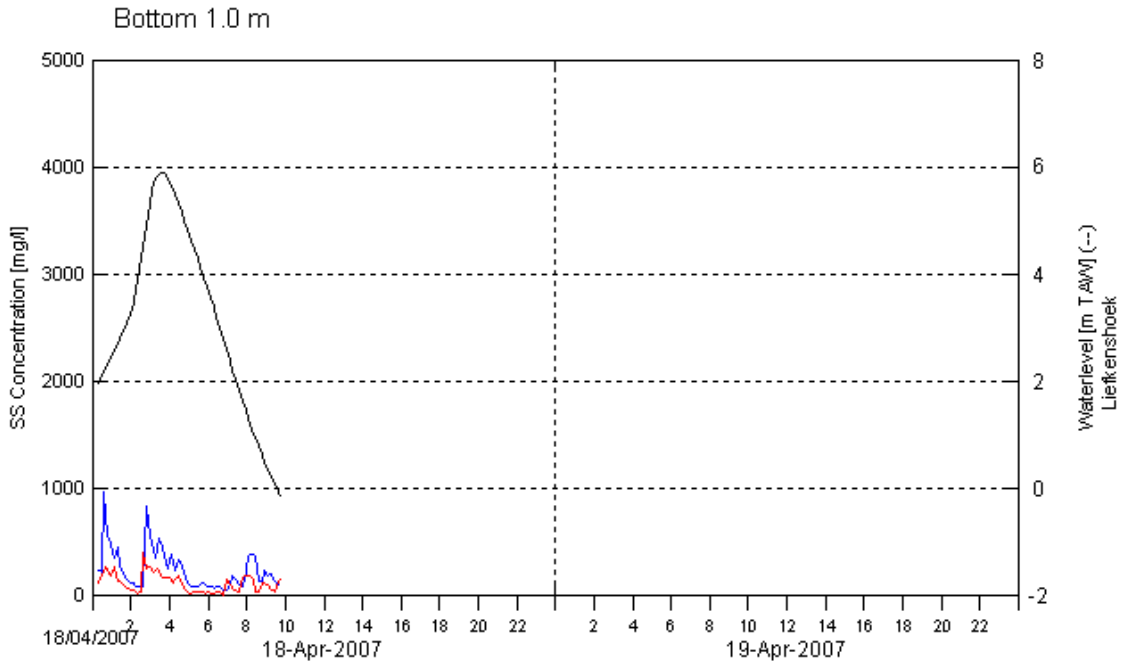
Date: 16/04/07 – 17/04/07

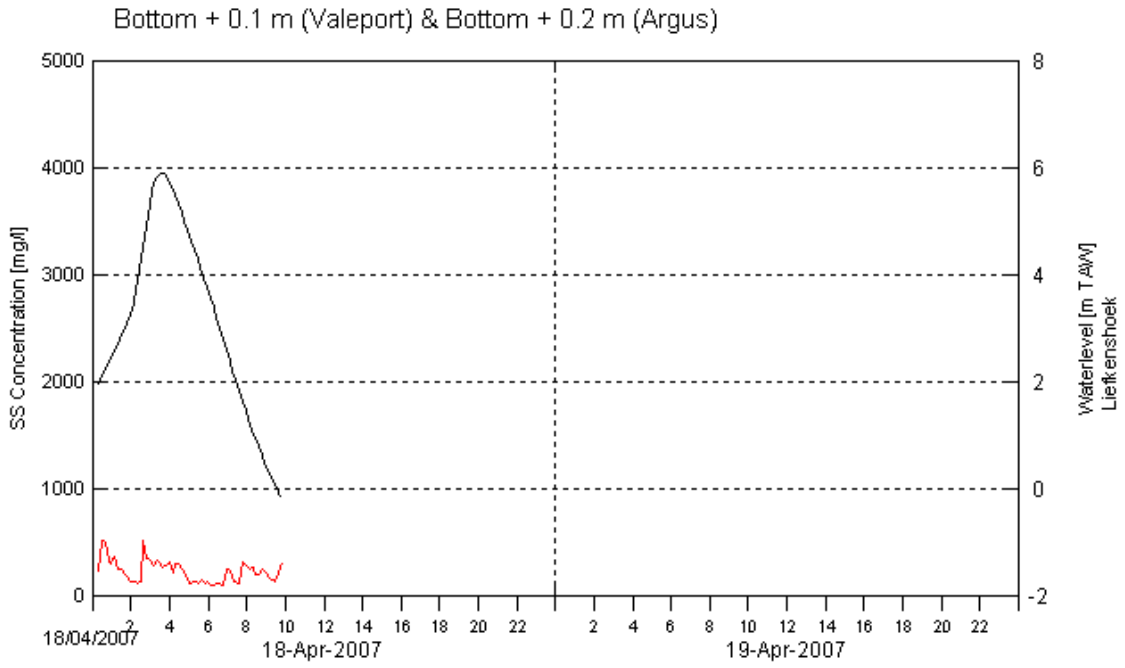
Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1 m and 0.1 m above the bottom for SS concentration

Location: Deurganckdok Sill

Date: 18/04/07

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

Comparison of SS concentrations during each tidal phase

Date	Tide No.	Phase	Tidal Diff [m]	OBS SS Concentration [mg/l]		Argus SS Concentration [mg/l]	
				UP (RCM9)	DOWN (Valeport)	UP	DOWN
20070209	1	flood	4.8	158.5	217.2	117.2	134.2
20070210	1	ebb	4.7	86.4	134.8	38	46.2
20070210	2	flood	4.6	151.7	202.3	113.1	127.8
20070210	2	ebb	4.7	81.5	134.7	41.8	48.6
20070210	3	flood	4.5	172.3	240.7	138.8	151.5
20070222	3	ebb	4.6	254.8	418	185.3	209
20070222	4	flood	5.9	464.7	761.6	387.8	458.3
20070222	4	ebb	6.3	174.6	274.3	109.1	135.9
20070222	5	flood	6	374.3	509.9	312.1	348.4
20070223	5	ebb	5.8	205.6	355.1	128	160.5
20070223	6	flood	5.7	407.3	669.4	354	392.8
20070223	6	ebb	5.9	201.6	531.4	133.3	174.8
20070223	7	flood	5.6	360.9	561.7	312.4	316.2
20070224	7	ebb	5	225.8	398.1	144.9	169.1
20070308	8	flood	4.7	267.2	-	147.8	168.3
20070308	8	ebb	5.9	162.2	-	79.7	93.8
20070308	9	flood	5.6	250.6	-	147	168.5
20070309	9	ebb	5.5	150.1	-	71.6	79.2
20070309	10	flood	5.3	245	-	136.4	163.6
20070309	10	ebb	5.4	104.3	-	40.8	44
20070309	11	flood	5.7	219.8	-	116.9	131
20070310	11	ebb	5.1	125.7	-	50.2	59.2
20070310	12	flood	4.8	191.6	-	110.5	131.3
20070310	12	ebb	5.4	100.2	-	35	37.1
20070310	13	flood	5	195.3	-	109.7	127.2
20070311	13	ebb	4.7	103.8	-	36.5	37.5
20070311	14	flood	4.7	139	-	74.8	97.3
20070311	14	ebb	4.9	80.7	-	24.9	29.8
20070311	15	flood	4.8	106	-	52.7	87.8
20070312	15	ebb	4.5	83.1	-	29	30.3
20070312	16	flood	4.5	96	-	48.7	61.3
20070312	16	ebb	4.5	121	-	40.4	41.4
20070312	17	flood	4.2	227.4	-	130.4	191.3
20070313	17	ebb	3.9	82.8	-	30.9	20.8
20070313	18	flood	4	104.5	-	48.5	61.7
20070313	18	ebb	3.8	50	-	12.9	6.5
20070313	19	flood	3.4	59.2	-	24.1	19.6
20070314	19	ebb	3.3	35.9	-	5.6	1.5
20070314	20	flood	3.3	76.3	-	33.9	33
20070314	20	ebb	3.6	44.7	-	13.2	7.3
20070314	21	flood	3.5	63.8	-	28.1	36
20070315	21	ebb	3.5	38.2	-	8.2	3.4
20070315	22	flood	4.1	108.9	-	61.2	68.9
20070315	22	ebb	4.2	125.9	-	55.5	58.6
20070316	23	flood	4.4	107.9	-	62.2	67

Comparison of SS concentrations during each tidal phase

Date	Tide No.	Phase	Tidal Diff [m]	OBS SS Concentration [mg/l]		Argus SS Concentration [mg/l]	
				UP (RCM9)	DOWN (Valeport)	UP	DOWN
20070316	23	ebb	4.2	52.2	-	17.1	16.4
20070316	24	flood	4.6	90.8	-	47.9	58.1
20070316	24	ebb	5	61.5	-	21.4	23.4
20070317	25	flood	5.1	111	-	62.6	94.7
20070317	25	ebb	4.4	72.4	-	25	31.7
20070317	26	flood	5.3	117.2	-	66.9	88.5
20070317	26	ebb	5.8	57.1	-	20.3	26
20070318	27	flood	5.5	160.3	-	94.2	109.8
20070318	27	ebb	5.4	101	-	42	45.8
20070318	28	flood	6.5	322.2	-	183.2	216.5
20070318	28	ebb	5.6	99.3	-	46.4	42.1
20070319	29	flood	5.3	158.8	-	86.4	91.5
20070319	29	ebb	6.4	141.4	-	67.3	71.9
20070319	30	flood	6.2	199.8	-	123.9	144.2
20070319	30	ebb	6.1	136.1	-	64.9	62.8
20070320	31	flood	5.7	176.3	-	107.5	124.1
20070320	31	ebb	6.3	107.4	-	46.5	57.5
20070320	32	flood	6.7	141.1	-	82.9	84.5
20070320	32	ebb	6.3	129	-	60.4	61.1
20070321	33	flood	6.1	187.6	-	119.9	126.5
20070321	33	ebb	6.3	135.9	-	61.7	66.2
20070322	34	flood	5.7	201.1	327.4	137.7	168.9
20070322	34	ebb	6.5	133.2	214.1	79.6	118.1
20070322	35	flood	6.6	259.8	409.5	185.2	211.4
20070323	35	ebb	6.3	232.8	325.7	145.1	175.8
20070323	36	flood	6.2	242.9	375.3	154.1	187.8
20070323	36	ebb	6.5	176.7	307.5	105.4	148.5
20070323	37	flood	6	227.2	389.3	166.2	199.2
20070324	37	ebb	5.9	105	169.4	69.6	101.8
20070324	38	flood	5.7	214.3	356.2	145.3	187.6
20070324	38	ebb	5.8	125.5	227.6	71.8	113.7
20070324	39	flood	5.5	187.8	290	130.8	163.5
20070325	39	ebb	5.4	188.1	492.3	117.6	159.1
20070325	40	flood	5.3	63.2	94.7	45.8	77.6
20070325	40	ebb	5.3	211	376.3	143.1	188.8
20070325	41	flood	4.8	50.4	78.3	29.9	63.3
20070325	41	ebb	4.8	77.4	154.4	57.6	91
20070326	42	flood	4.8	131.7	232.7	89	125.7
20070326	42	ebb	4.5	150.7	240.4	91.4	132.8
20070326	43	flood	4.2	219.6	367.5	141.2	177.8
20070327	43	ebb	4.2	64.9	202.7	44.1	64.2
20070327	44	flood	4.4	213.4	360.6	147.8	167.5
20070327	44	ebb	4	73	160.1	56.8	76.6
20070327	45	flood	3.6	109.9	201.1	90.5	110
20070328	45	ebb	3.9	58.4	114.7	27.9	50.9
20070328	46	flood	4.3	148.6	264.5	109.4	119.6

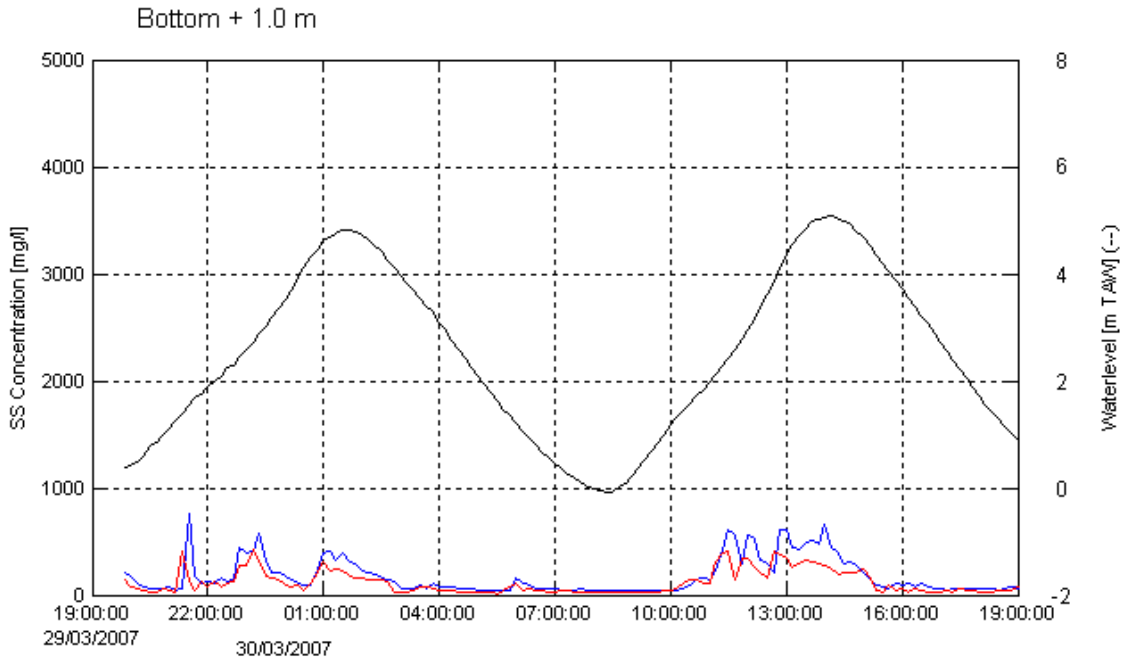
Comparison of SS concentrations during each tidal phase

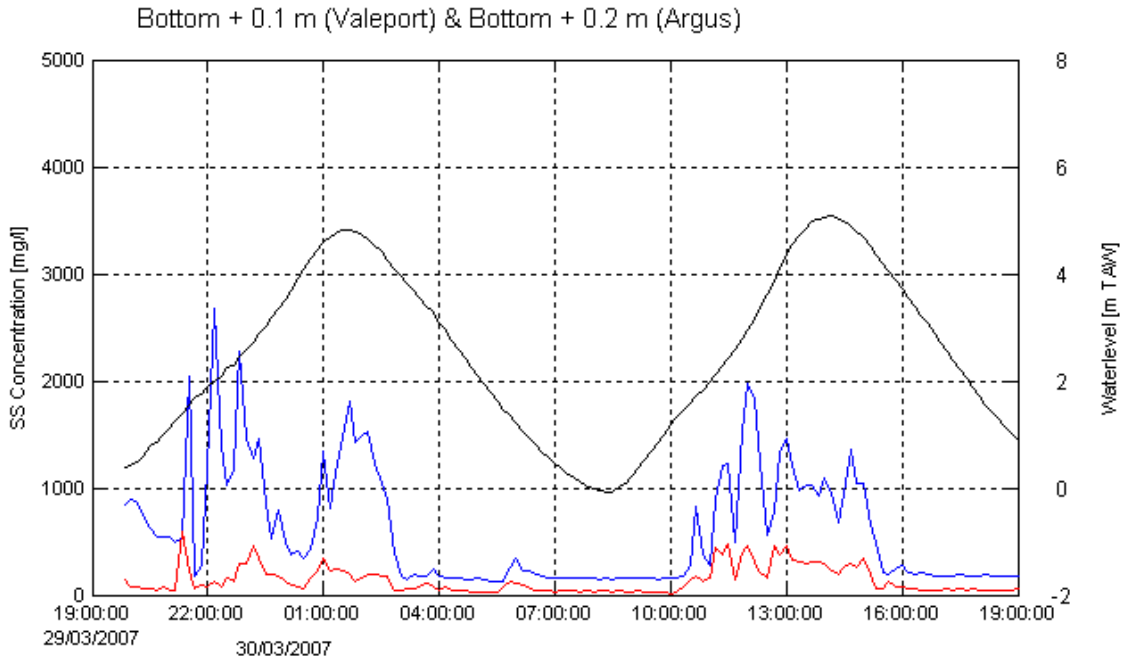
Date	Tide No.	Phase	Tidal Diff [m]	OBS SS Concentration [mg/l]		Argus SS Concentration [mg/l]	
				UP (RCM9)	DOWN (Valeport)	UP	DOWN
20070328	46	ebb	4.1	79.1	173.3	48.4	65.4
20070329	47	flood	4	190.8	322.6	124	152.3
20070329	47	ebb	4.3	71.8	273.9	40.4	54.7
20070329	48	flood	4.8	250.5	558.4	169.7	191.4
20070329	48	ebb	4.6	153.1	333.9	92.2	102.8
20070330	49	flood	4.4	215.6	936.2	145.2	167.1
20070330	49	ebb	4.9	88.4	378.8	56.9	71.4
20070330	50	flood	5.2	277.6	724.3	189.1	208.4
20070330	50	ebb	4.9	99.2	322.8	67.6	84.1
20070331	51	flood	4.8	195.1	607	129.4	143.6
20070331	51	ebb	5.3	112.5	323.3	76.5	85.1
20070331	52	flood	5.5	168.3	489.7	121.2	133.7
20070331	52	ebb	5.2	114.6	419.9	69.2	88.6
20070401	53	flood	5	219.9	300.3	142.4	163.2
20070401	53	ebb	5.6	101.5	-	60.6	78.7
20070401	54	flood	5.7	189.3	-	119	140.6
20070401	54	ebb	5.5	118.4	-	69	83.8
20070402	55	flood	5.5	221.3	-	147.1	179.2
20070402	55	ebb	5.7	112.5	-	64.7	85.8
20070402	56	flood	5.9	219	-	142.1	172.8
20070402	56	ebb	5.6	154.1	-	91.5	115.6
20070403	57	flood	5.6	230.6	-	155.1	171.8
20070403	57	ebb	5.9	176.2	-	101.2	128.1
20070403	58	flood	6.1	263.3	-	169.9	198.6
20070403	58	ebb	5.7	118.9	-	68.1	91
20070404	59	flood	5.6	281.3	-	185	222.3
20070404	59	ebb	5.4	114.4	-	62.7	89.4
20070405	60	flood	3.5	184.1	-	105.5	126.8
20070405	60	ebb	5.8	172.7	-	99.1	121.5
20070405	61	flood	5.8	226.1	-	136.5	158.9
20070405	61	ebb	5.6	219.9	-	137.4	196.7
20070406	62	flood	5.6	272.8	-	149.4	174.4
20070406	62	ebb	5.7	121.5	-	60.7	80.6
20070406	63	flood	4.8	273.2	-	142.8	606.9
20070407	63	ebb	5.5	261.8	-	116.1	591.6
20070407	64	flood	5.4	262	-	136.9	636.3
20070407	64	ebb	5.4	110.3	-	42.3	529.1
20070407	65	flood	5.3	149.1	-	75.5	559.2
20070408	65	ebb	5.3	120.5	-	55.4	540
20070408	66	flood	5.1	147.6	-	76.6	566.7
20070408	66	ebb	5.2	88.9	-	32	528.9
20070408	67	flood	5	144.5	-	71.6	562.4
20070409	67	ebb	4.8	79.9	-	29.1	522.5
20070409	68	flood	5	135.8	-	70.1	570.6
20070409	68	ebb	4.8	73.7	-	25.4	524
20070409	69	flood	4.5	102.7	-	52.6	549.2

Comparison of SS concentrations during each tidal phase

Date	Tide No.	Phase	Tidal Diff	OBS SS Concentration [mg/l]		Argus SS Concentration [mg/l]	
			[m]	UP (RCM9)	DOWN (Valeport)	UP	DOWN
20070410	69	ebb	4.7	114.5	-	49.8	557.8
20070410	70	flood	4.6	163.2	-	84.7	591.7
20070410	70	ebb	4.3	66.9	-	22.7	524.8
20070410	71	flood	3.9	66.2	-	30.2	497.9
20070411	71	ebb	4.1	47.1	-	9.5	475.5
20070411	72	flood	4.2	78.5	-	36.9	502.7
20070411	72	ebb	4	83.3	-	36.7	506.8
20070411	73	flood	3.5	60.3	-	28.8	501.9
20070412	73	ebb	3.7	53.4	-	12	485.6
20070412	74	flood	3.9	92.5	-	45.9	523.7
20070412	74	ebb	3.9	57.5	-	18.7	495.2
20070412	75	flood	3.6	96.4	-	48.2	526.8
20070413	75	ebb	3.8	234.5	-	119.7	613.3
20070413	76	flood	4.3	164.1	-	80.9	565.7
20070413	76	ebb	4.4	66.7	-	24.6	500.4
20070414	77	flood	4.3	122.9	-	63.4	541.6
20070414	77	ebb	4.6	123.4	-	59.9	351.7
20070414	78	flood	5.2	216.5	-	118.7	218.8
20070414	78	ebb	5	71.1	-	23.6	121.2
20070415	79	flood	5	177.1	-	95	188.5
20070415	79	ebb	5.3	61	-	16.6	113.3
20070415	80	flood	5.8	172.7	-	94.4	186.3
20070415	80	ebb	5.6	100.6	-	48.2	137.4
20070416	81	flood	5.5	177	-	92.3	186.4
20070416	81	ebb	5.8	101.8	-	34.3	130.8
20070416	82	flood	6.3	180	-	84.4	183.1
20070416	82	ebb	6	137.1	-	58.1	168.9
20070417	83	flood	5.7	223.3	-	100.6	213.3
20070417	83	ebb	6.3	144.2	-	57	161
20070417	84	flood	6.5	187.2	-	88.1	186.9
20070417	84	ebb	6.1	227.8	-	100.4	209.3
20070418	85	flood	6.1	298.1	-	132.4	244.5

11283 Accretion Deurganckdok – Near bed continuous monitoring – Winter 2007





Comparison of RCM9 & Valeport (blue) to Argus sensors (red) at 1m and 0.1 m above the bottom for SS concentration

Location:	Date:
Deurganckdok Sill	Avg Tide 29/03 – 30/03

Data processed by: IMDC

In association with: WL | delft hydraulics, GEMS International

I/RA/11283/06.123/MSA

APPENDIX F.

HCBS2 REPORTS

Report	Description
Ambient Conditions Lower Sea Scheldt	
5.3	Overview of ambient conditions in the river Scheldt – January-June 2006 (I/RA/11291/06.088/MSA)
5.4	Overview of ambient conditions in the river Scheldt – July-December 2006 (I/RA/11291/06.089/MSA)
~~5.5~~	~~Overview of ambient conditions in the river Scheldt : RCM-9 buoy 84 & 97 (1/1/2007 -31/3/2007) (I/RA/11291/06.090/MSA)~~*
5.6	Analysis of ambient conditions 21/09/05 - 31/3/2007 (I/RA/11291/06.091/MSA)
Calibration	
6.1	Winter Calibration (I/RA/11291/06.092/MSA)
6.2	Summer Calibration and Final Report (I/RA/11291/06.093/MSA)
Through tide Measurements Winter 2006	
7.1	21/3 Scheldewacht – Deurganckdok – Salinity Distribution (I/RA/11291/06.094/MSA)
7.2	22/3 Parel 2 – Deurganckdok (I/RA/11291/06.095/MSA)
7.3	22/3 Laure Marie – Liefkenshoek (I/RA/11291/06.096/MSA)
7.4	23/3 Parel 2 – Schelle (I/RA/11291/06.097/MSA)
7.5	23/3 Laure Marie – Deurganckdok (I/RA/11291/06.098/MSA)
7.6	23/3 Veremans Waarde (I/RA/11291/06.099/MSA)
HCBS Near bed continuous monitoring (Frames)	
8.1	Near bed continuous monitoring winter 2006 (I/RA/11291/06.100/MSA)
INSSEV	
9	Settling Velocity - INSSEV summer 2006 (I/RA/11291/06.102/MSA)
Cohesive Sediment	

10	Cohesive sediment properties summer 2006 (I/RA/11291/06.103/MSA)
Through tide Measurements Summer 2006	
11.1	Through Tide Measurement Sediview and Siltprofiler 27/9 Stream - Liefkenshoek (I/RA/11291/06.104/MSA)
11.2	Through Tide Measurement Sediview 27/9 Veremans - Raai K (I/RA/11291/06.105/MSA)
11.3	Through Tide Measurement Sediview and Siltprofiler 28/9 Stream - Raai K (I/RA/11291/06.106/MSA)
11.4	Through Tide Measurement Sediview 28/9 Veremans – Waarde (I/RA/11291/06.107/MSA)
11.5	Through Tide Measurements Sediview 28/9 Parel 2 - Schelle (I/RA/11291/06.108/MSA)
11.6	Through Tide measurement Longitudinal Salinity Distribution 26/9 Scheldewacht – Deurganckdok (I/RA/11291/06.161/MSA)
Analysis	
12	Report concerning the presence of HCBS layers in the Scheldt river (I/RA/11291/06.109/MSA)

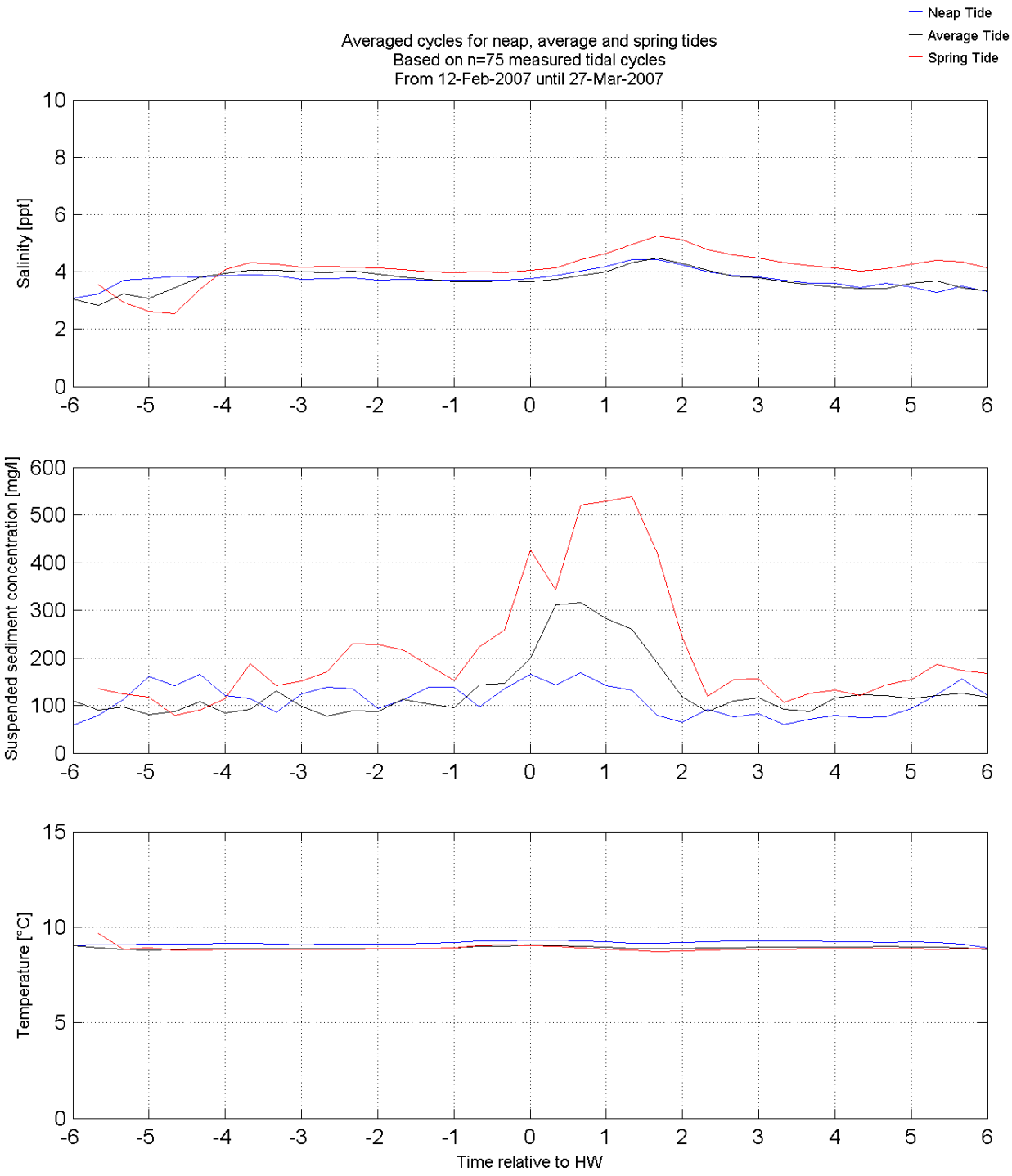
* Report 5.5 will be handled in report 3.1. Boundary conditions: Three monthly report 1/1/2007 – 31/03/2007 (I/RA/11283/06.127/MSA) including HCBS 2 report 5.5 (Deurganckdok).

APPENDIX G. AVERAGE TIDAL CYCLES

G.1 Local parameters

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: N-ENTRANCE bottom



Absolute Parameters for averaged tidal cycle

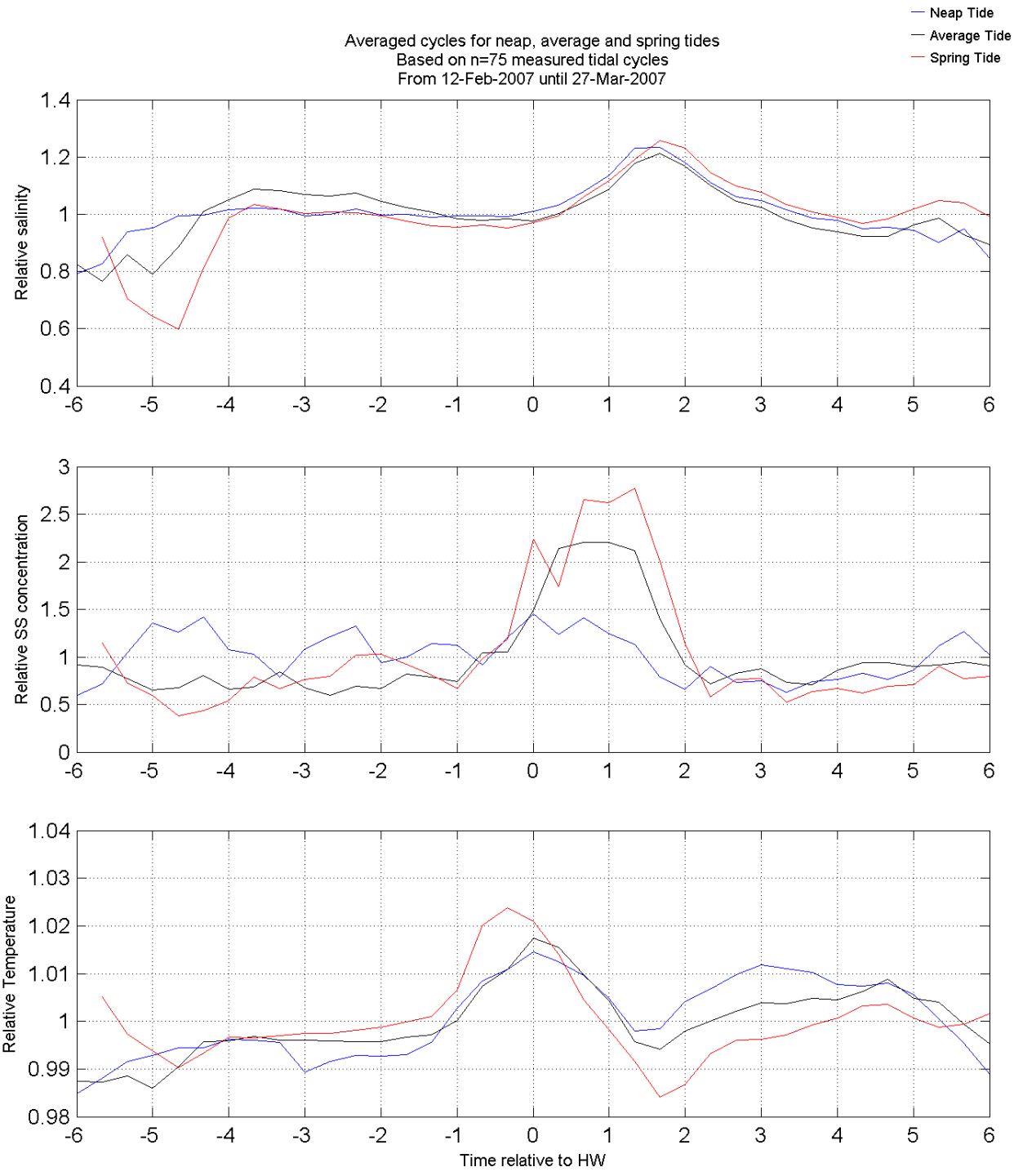
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: N-ENTRANCE bottom



Relative Parameters for averaged tidal cycle

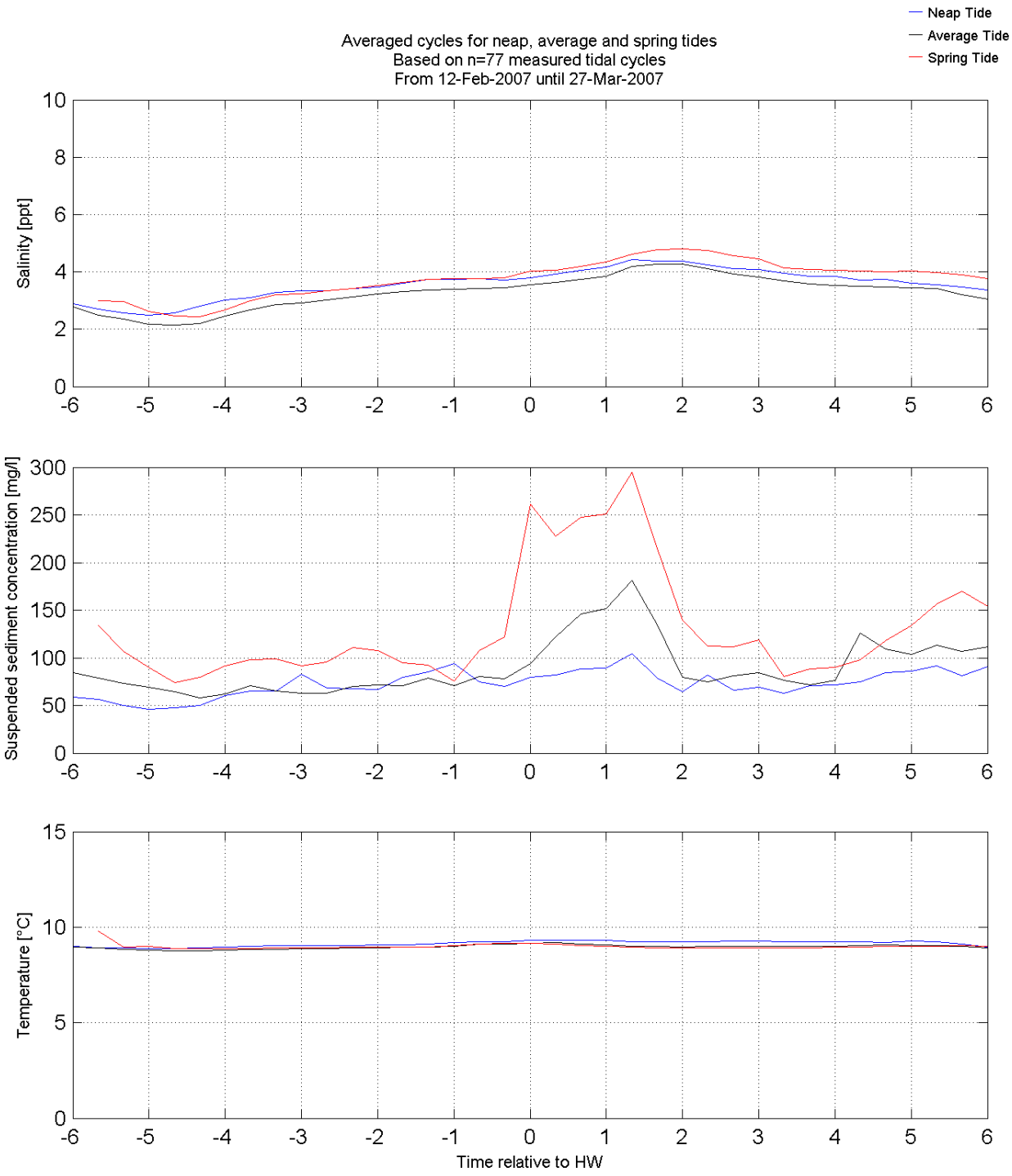
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: N-ENTRANCE top



Absolute Parameters for averaged tidal cycle

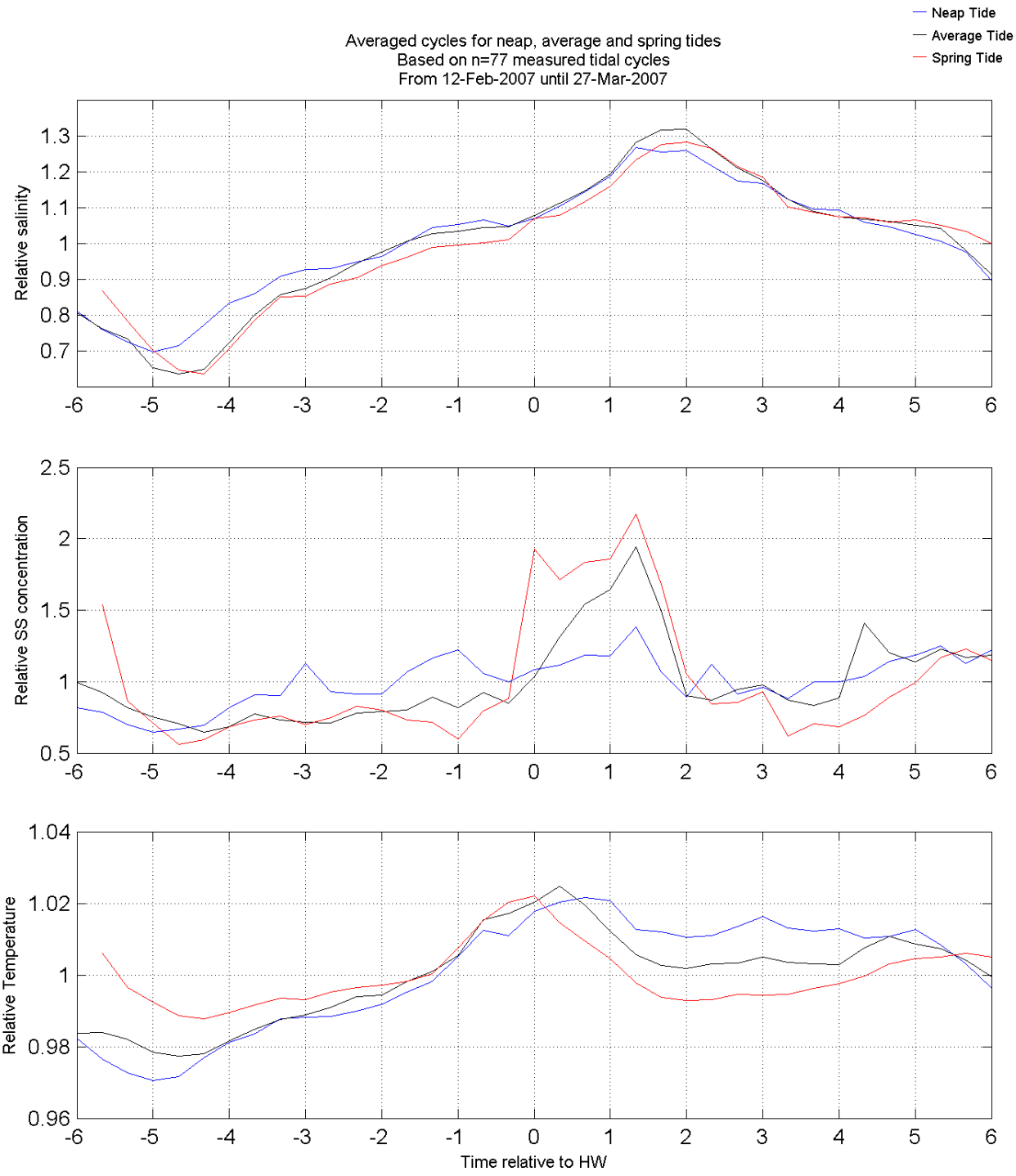
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: N-ENTRANCE top



Relative Parameters for averaged tidal cycle

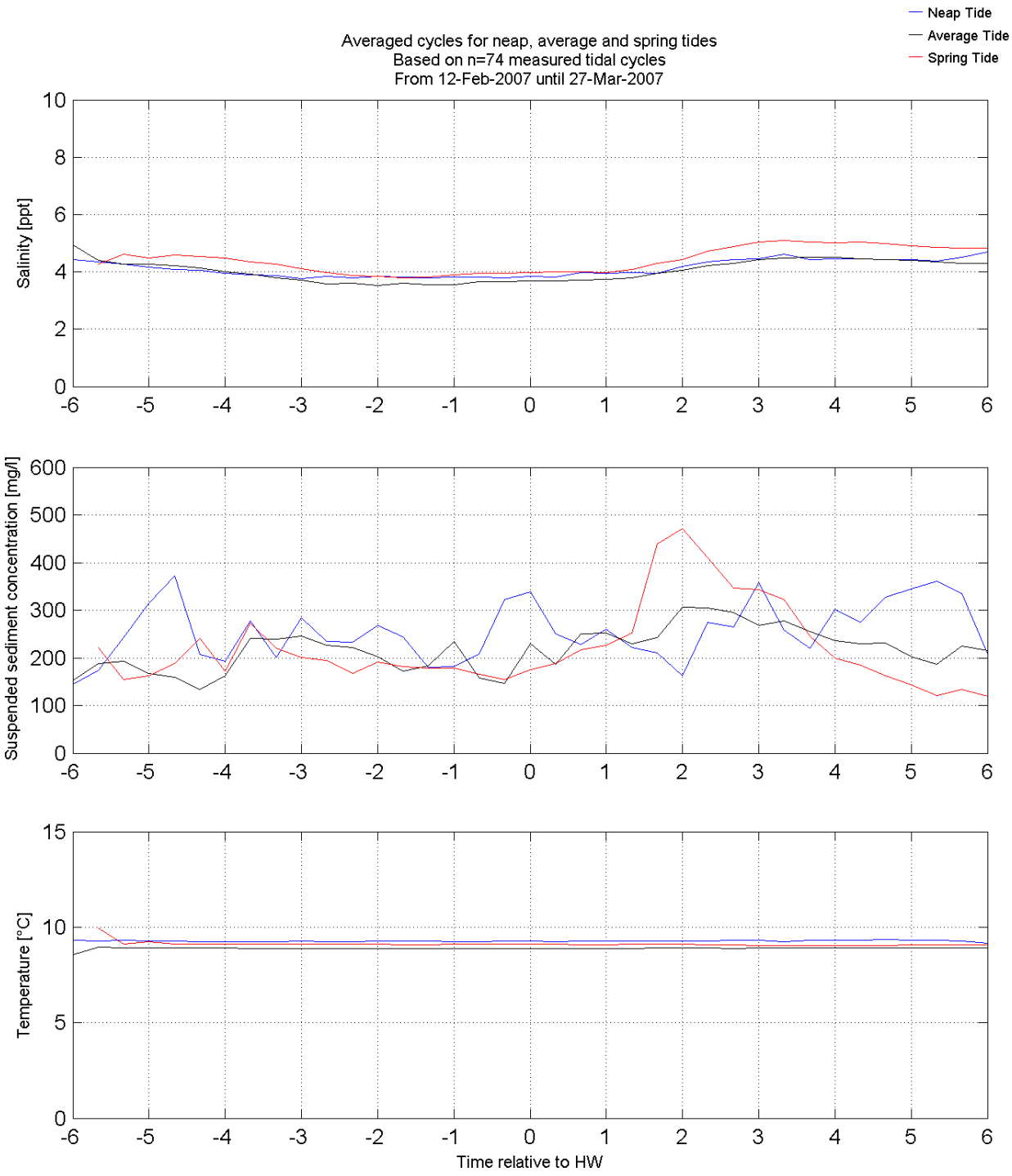
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: S-BACK bottom



Absolute Parameters for averaged tidal cycle

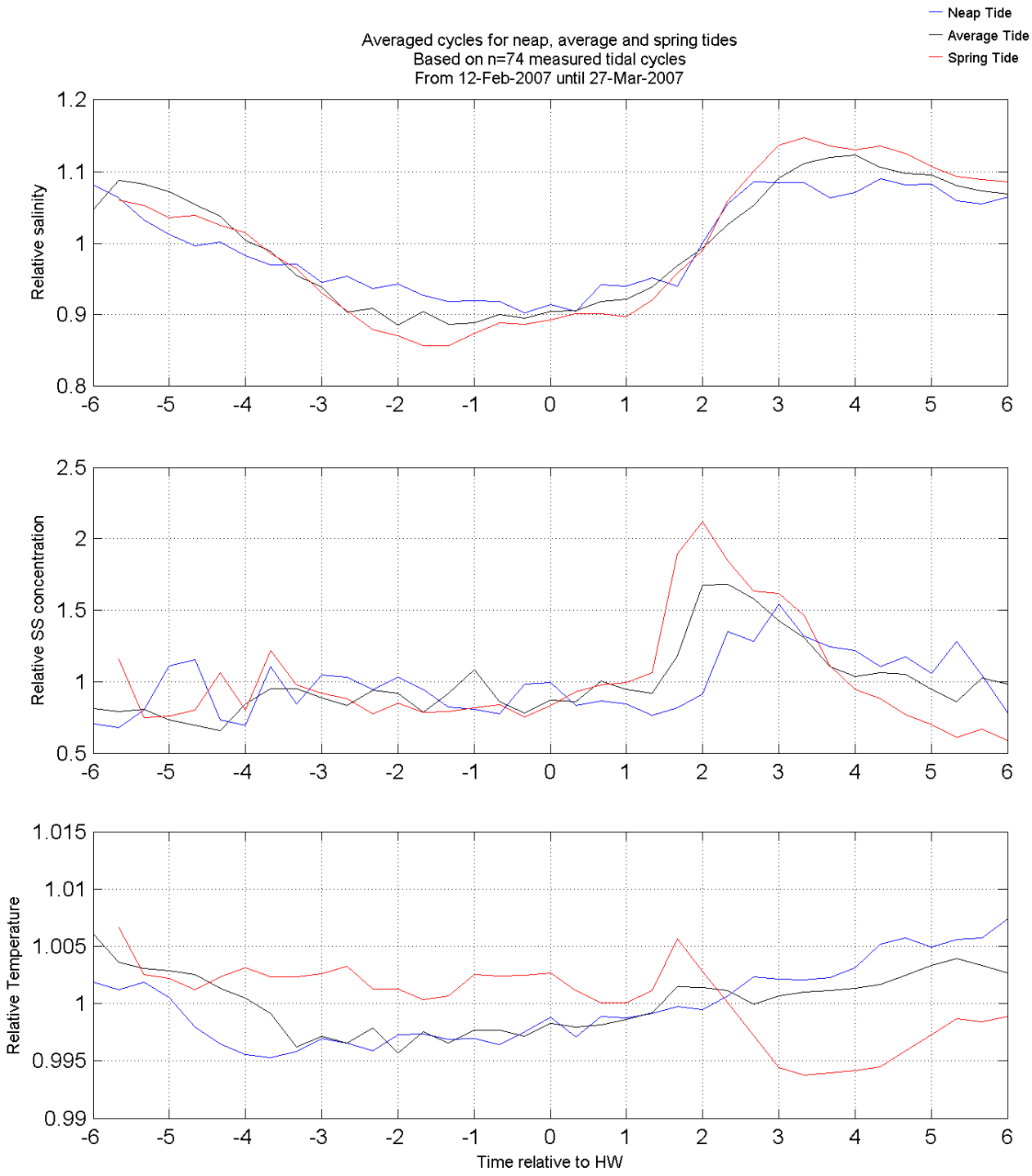
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: S-BACK bottom



Relative Parameters for averaged tidal cycle

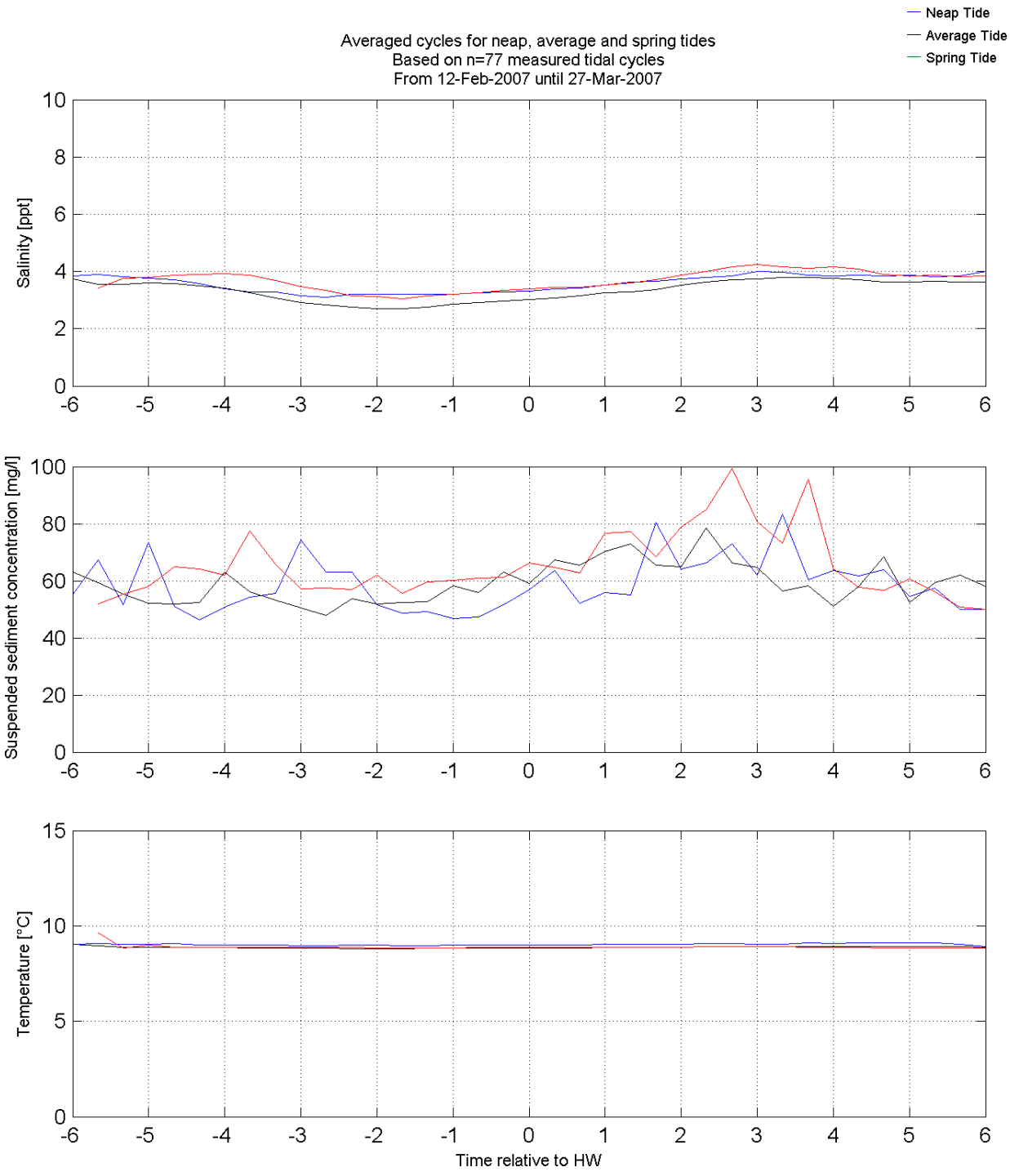
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: S-BACK top



Absolute Parameters for averaged tidal cycle

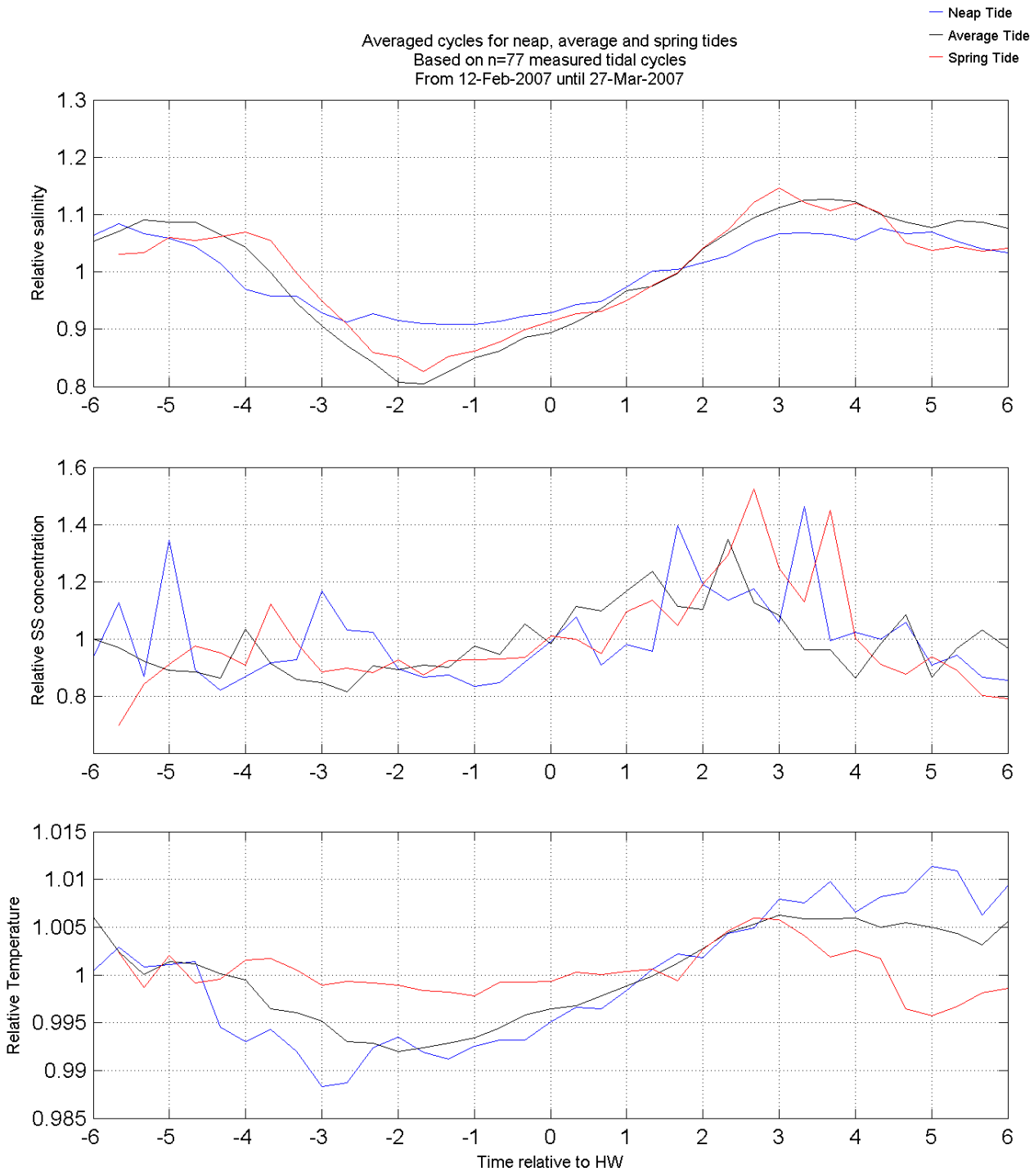
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: S-BACK top



Relative Parameters for averaged tidal cycle

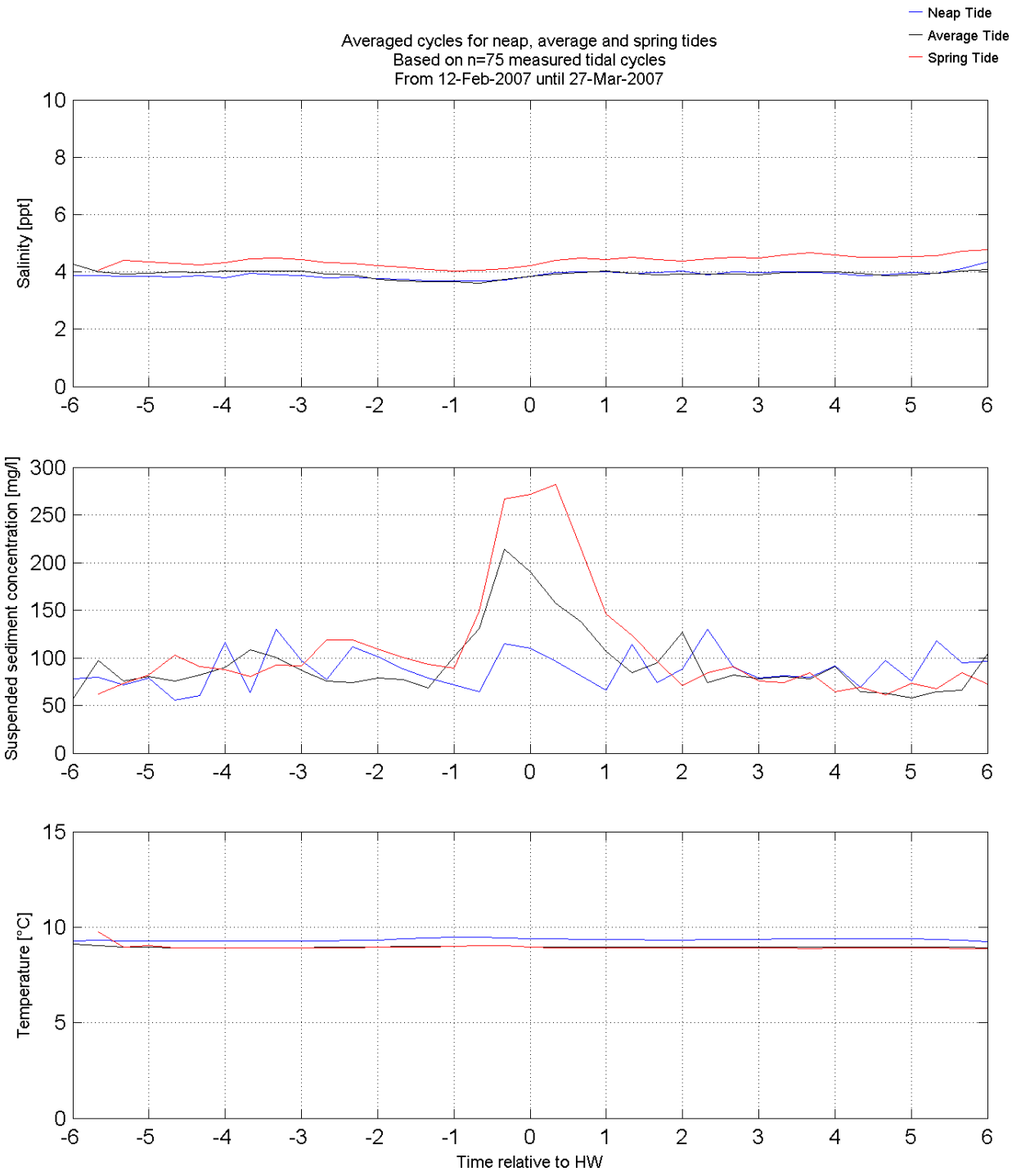
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: S-ENTRANCE bottom



Absolute Parameters for averaged tidal cycle

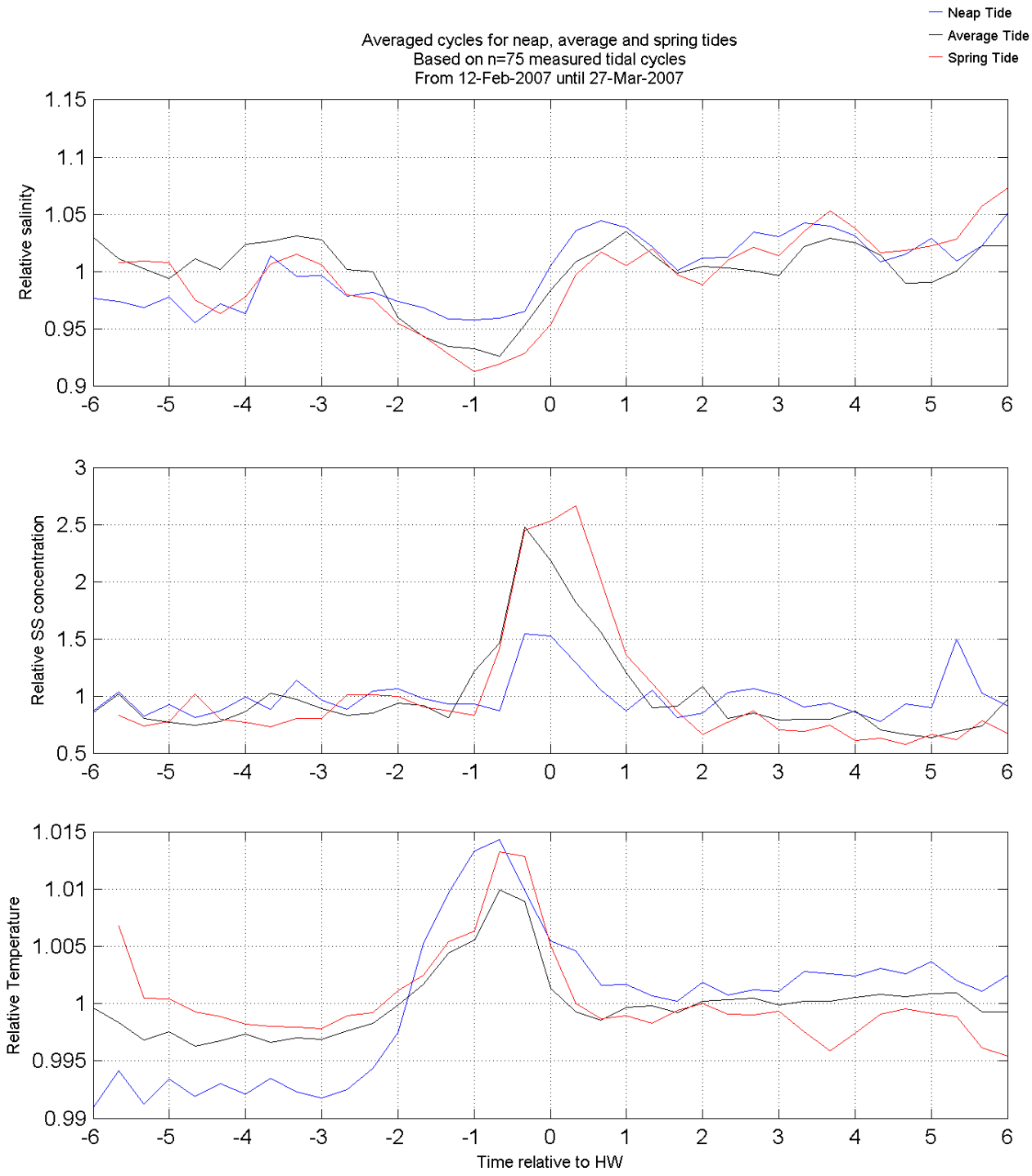
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: S-ENTRANCE bottom



Relative Parameters for averaged tidal cycle

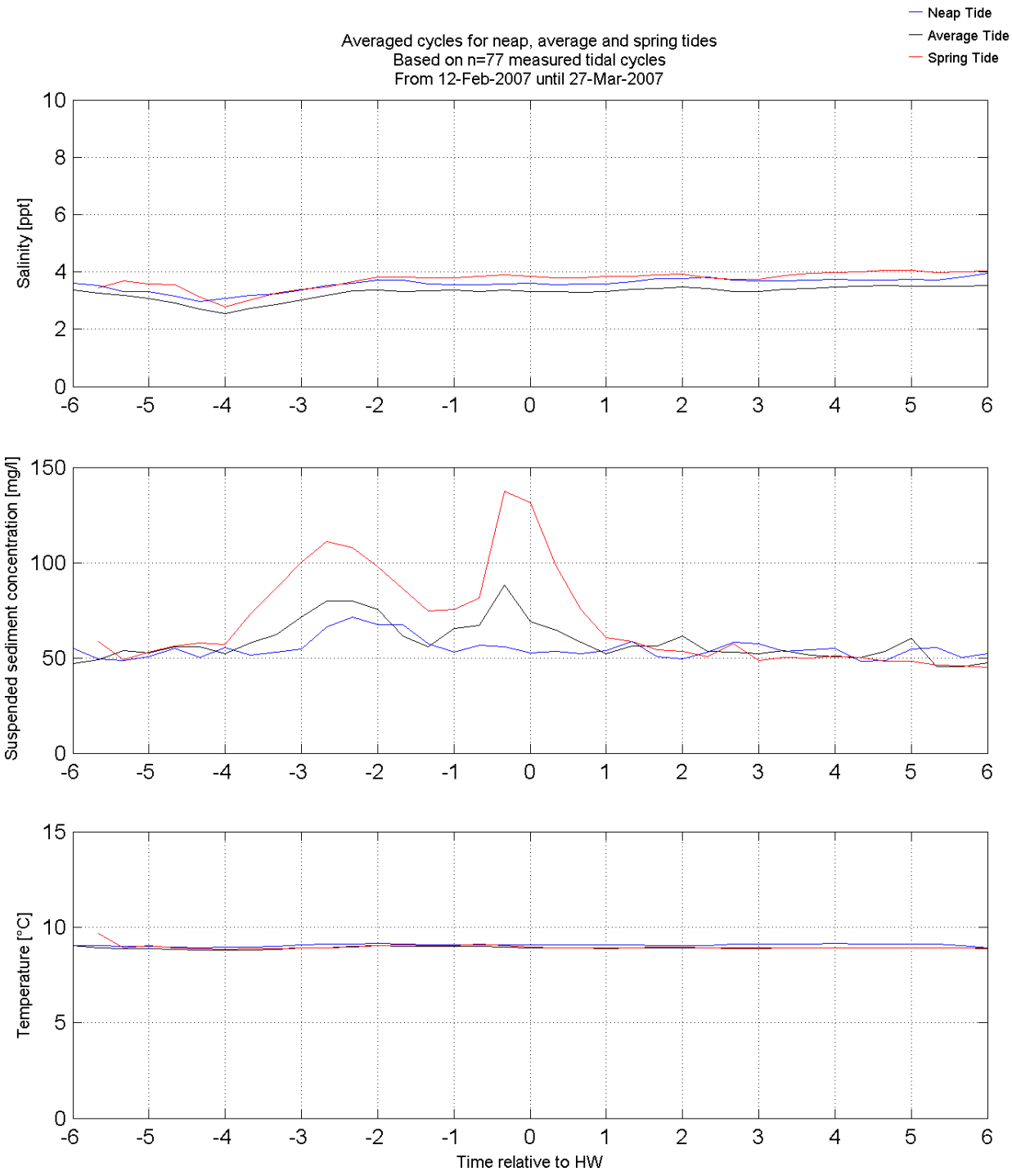
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: S-ENTRANCE top



Absolute Parameters for averaged tidal cycle

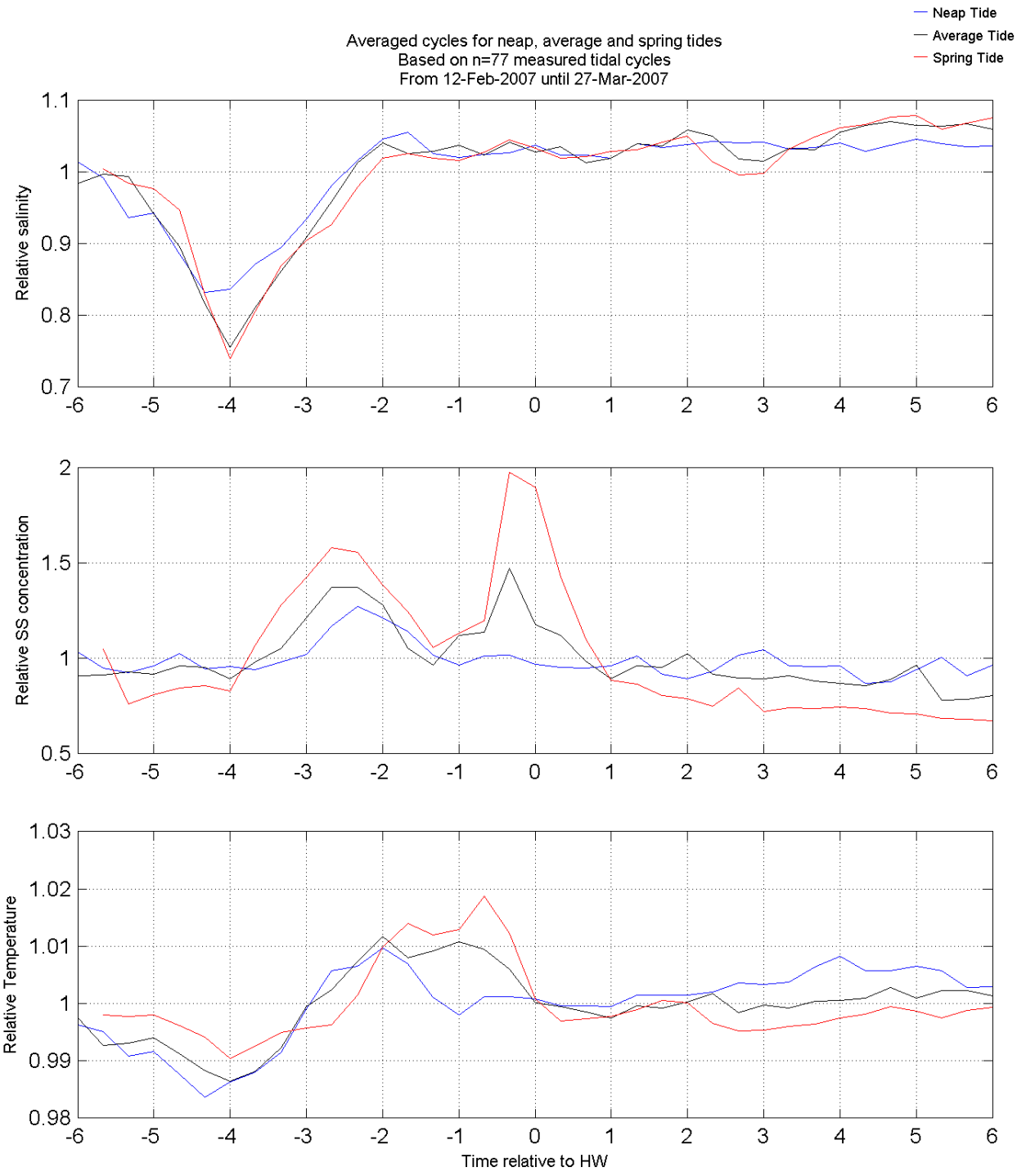
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS-3A
	Location: S-ENTRANCE top



Relative Parameters for averaged tidal cycle

Data Processed by:

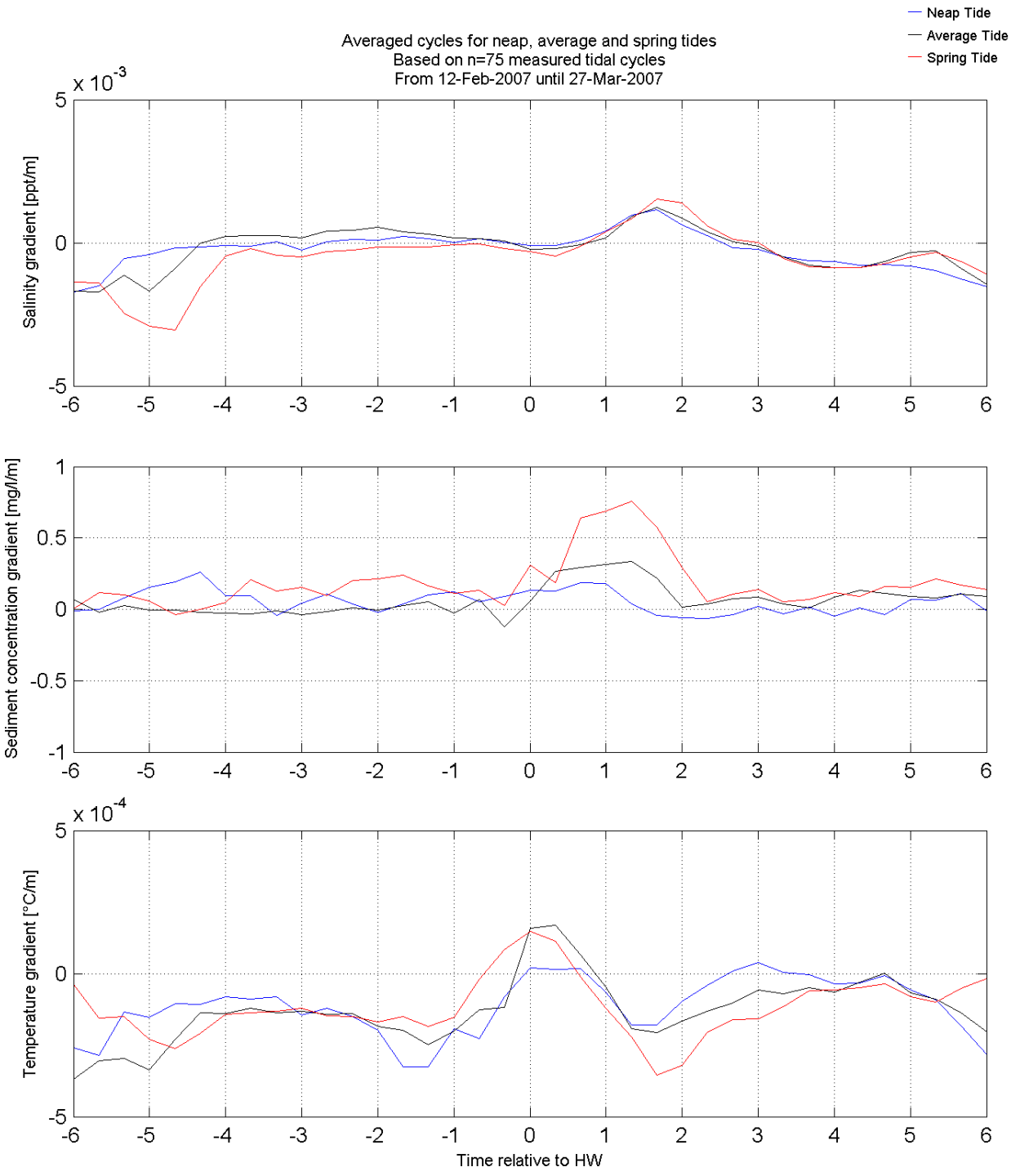
In association with :

I/RA/11283/06.123/MSA

G.2 Along-dock, cross-dock and vertical gradients

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS 3A
	Location: DGD-entrance



Horizontal gradient at -12m TAW =(N-ENTRANCE - S-ENTRANCE)/Δx

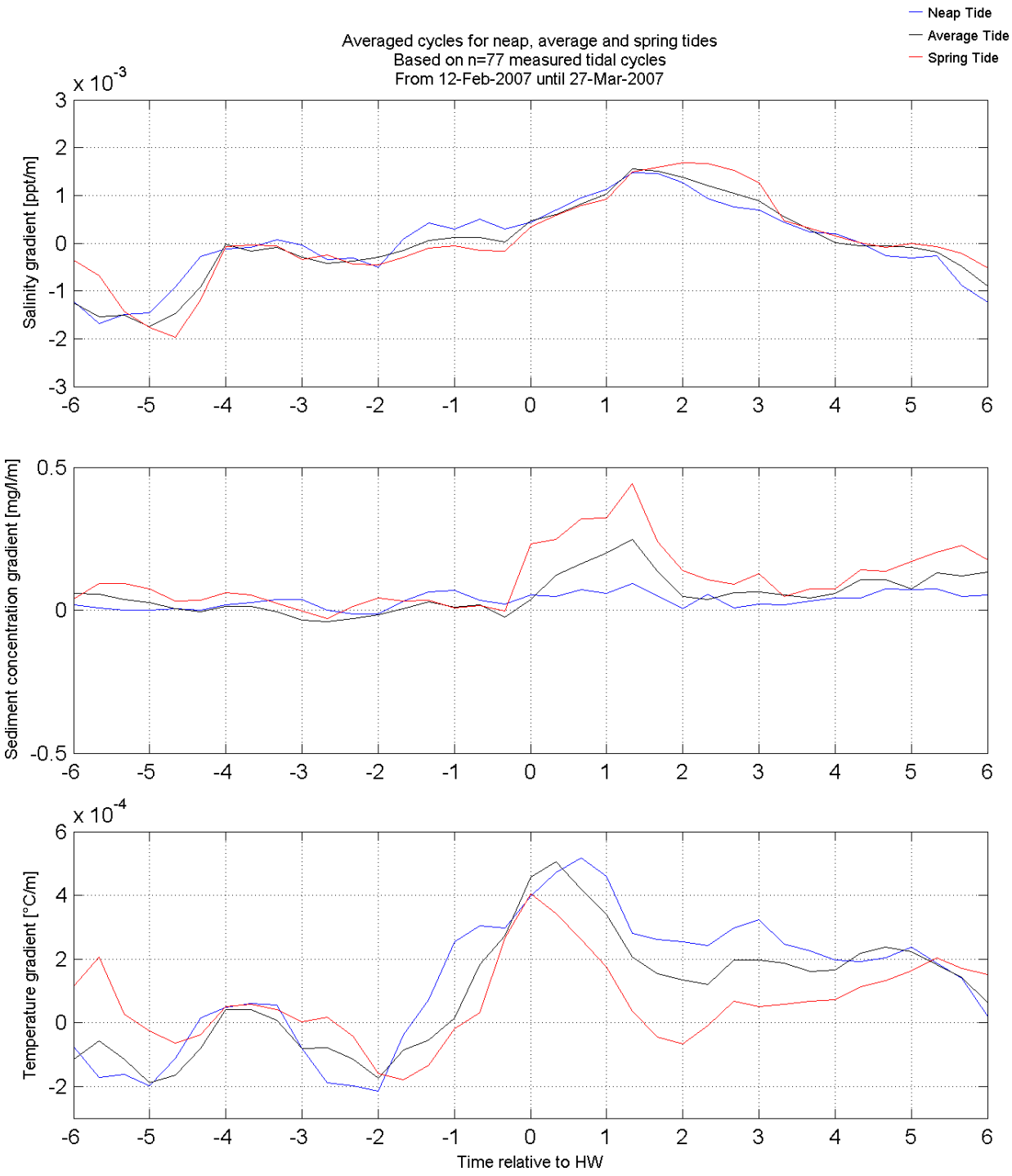
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS 3A
	Location: DGD-entrance



Horizontal gradient at -2.2m TAW =(N-ENTRANCE - S-ENTRANCE)/Δx

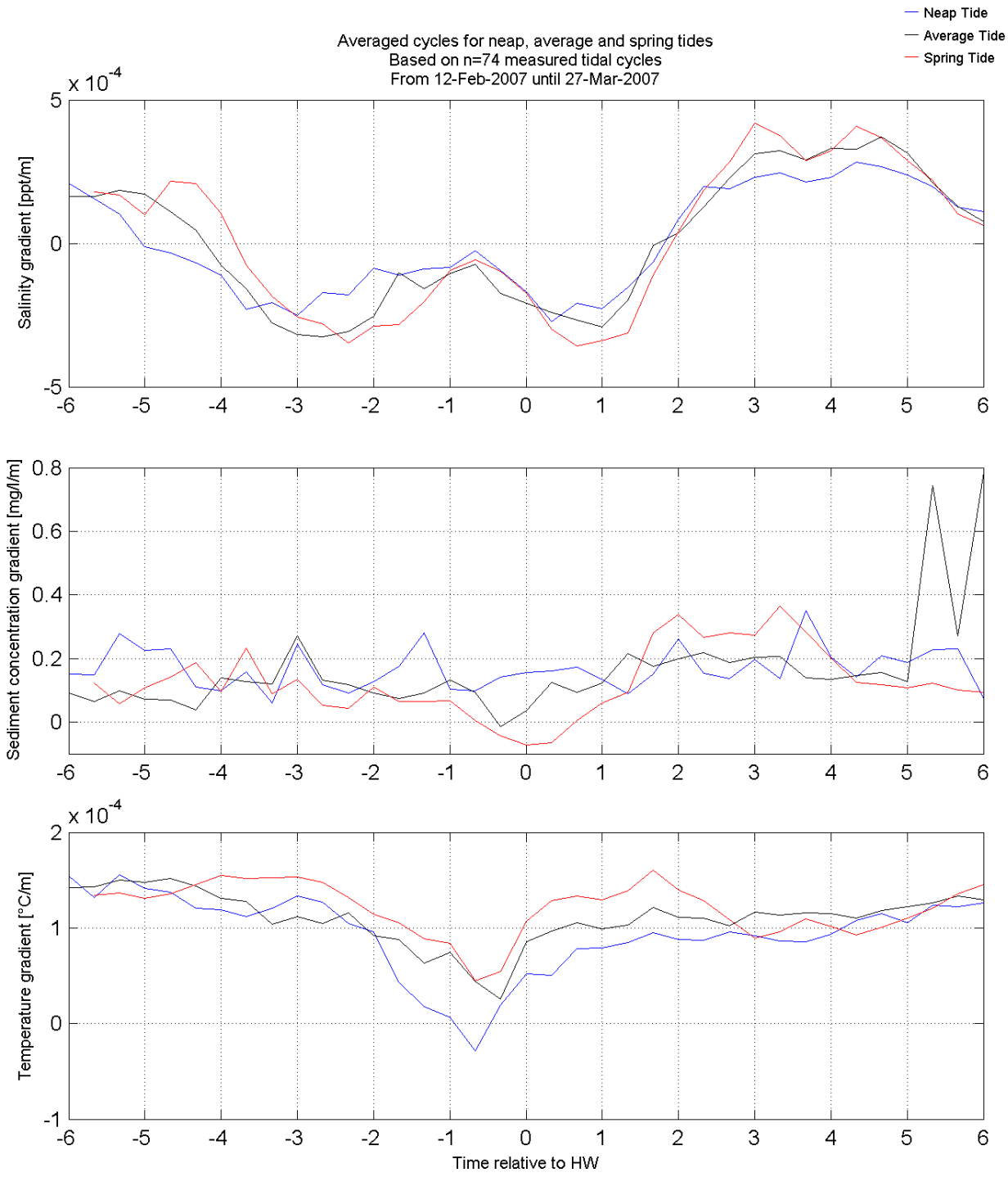
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS 3A
	Location: DGD-P&O (S)



Horizontal gradient at -12.6 m TAW =(S-BACK - S-ENTRANCE)/Δx

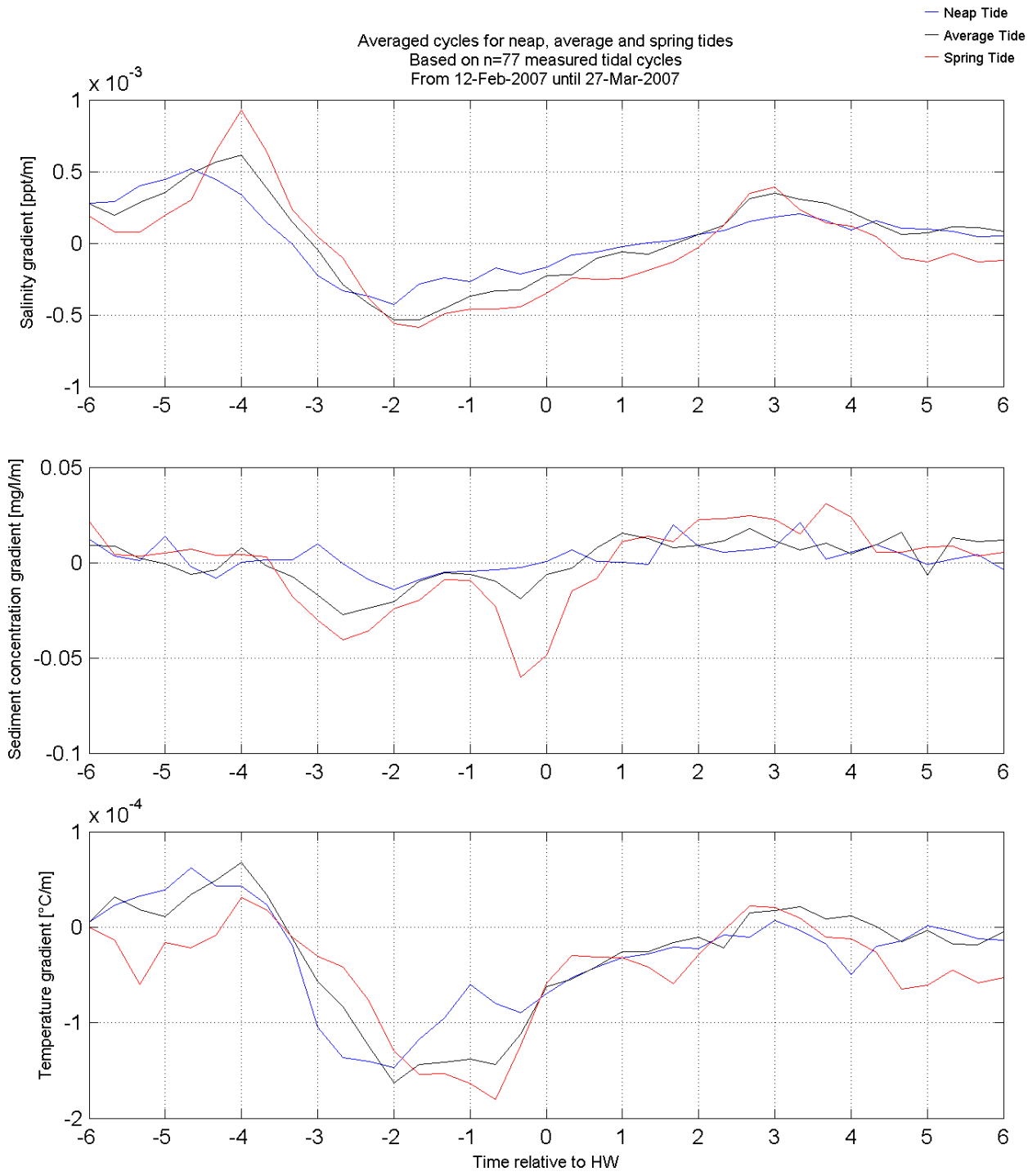
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS 3A
	Location: DGD-P&O (S)



Horizontal gradient at -2.4 m TAW =(S-BACK - S-ENTRANCE)/Δx

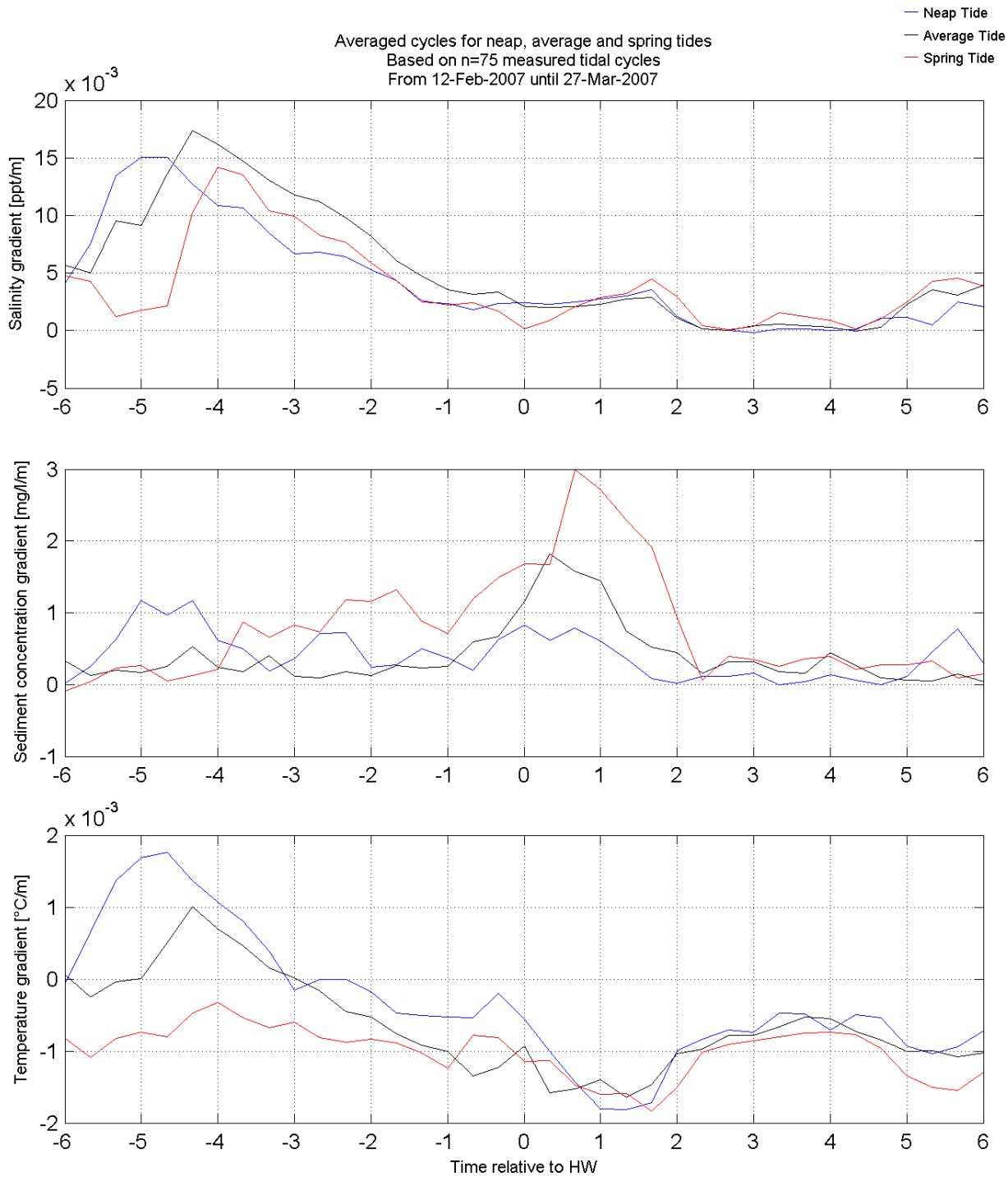
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS 3A
	Location: DGD-PSA (N-entrance)



Vertical gradient at N-ENTRANCE =(data(-12.0m) - data(-2.3m))/Δz

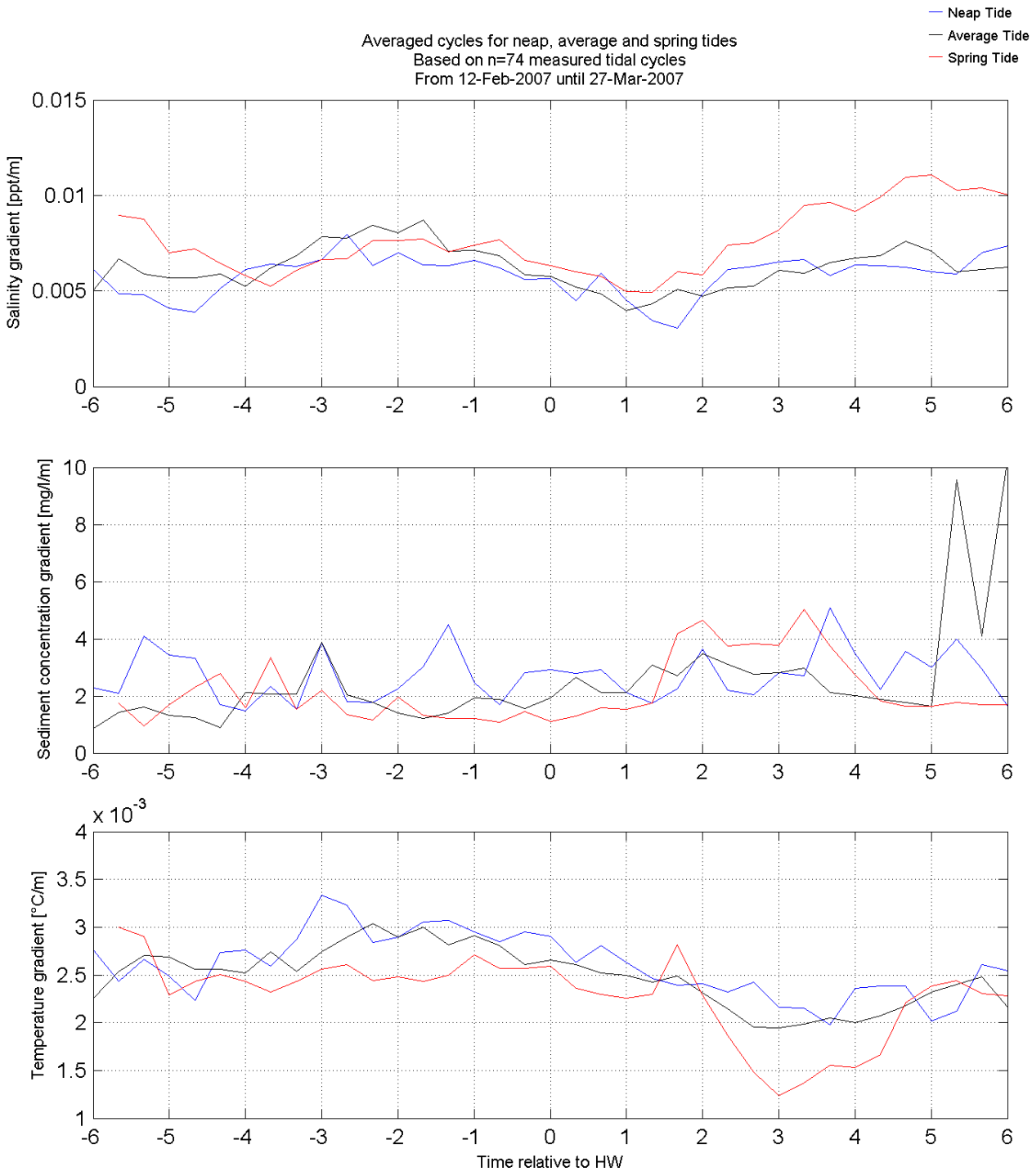
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS 3A
	Location: DGD-P&O1 (S-back)



Vertical gradient at S-BACK =(data(-12.1m) - data(-2.6m))/Δz

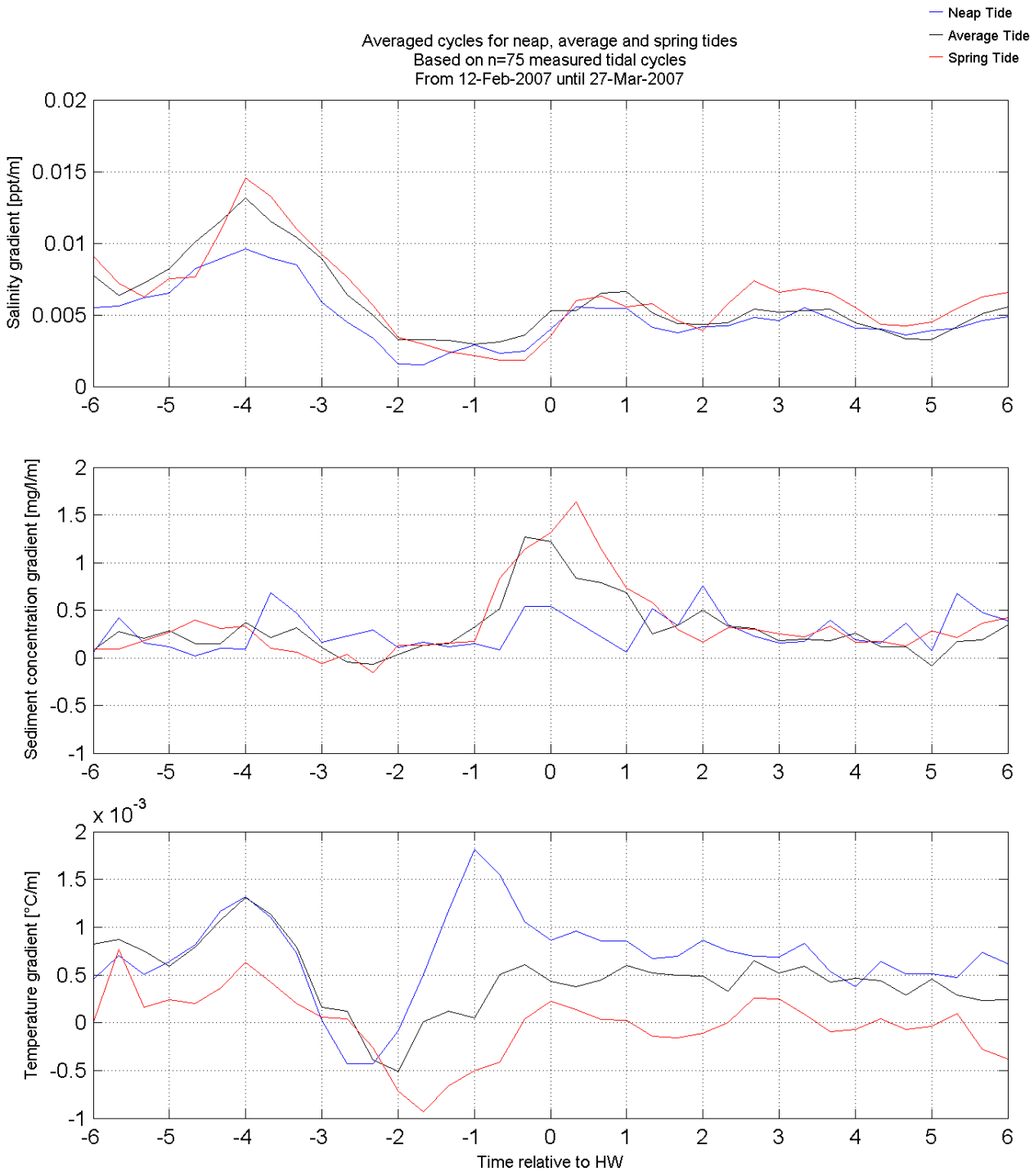
Data Processed by:

In association with :

I/RA/11283/06.123/MSA

Long Term Monitoring Siltation Deurganckdok

Winter 2007	OBS 3A
	Location: DGD-P&O2 (S-entrance)



Vertical gradient at S-ENTRANCE =(data(-13.0m) - data(-2.2m))/Δz

Data Processed by:

In association with :

I/RA/11283/06.123/MSA